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FORTY-FIFTH ANNUAL REPORT OF THE WESTERN WHEAT QUALITY LABORATORY 1992 CROP¹

**Quality Characteristics of Cultivars and
New Germplasm of Wheat Bred and Grown in
the Western United States²**

ABRIDGED

United States Department of Agriculture
Agricultural Research Service
and
Agricultural Experiment Stations
of the United States

C.F. Morris, H.C. Jeffers, D.A. Engle, M.L. Baldrige,
B.S. Patterson, A.D. Bettge, and R.L. Ader³

April 1994

¹This is a Progress Report of cooperative investigations of the milling and baking characteristics of current commercial cultivars and new germplasm of wheat grown in the Western United States. Interpretation of the data may be changed with further experimentation; therefore, data in this report are not for publication, display, or distribution without prior written approval of the Agricultural Research Service, USDA and the cooperating agencies concerned.

²In cooperation with the Arizona, California, Idaho, Montana, Oregon, Utah, and Washington Agricultural Experiment Stations who developed and grew the experimental wheat selections studied.

³Supervisory Research Chemist (Director), Cereal Food Technologist, Physical Science Technician, Biological Technician, Technician, Biological Technician, Physical Science Technician, and Office Automation Assistant, respectively, U.S. Department of Agriculture, Agricultural Research Service, assigned to the Western Wheat Quality Laboratory, Wheat Genetics, Quality, Physiology and Disease Unit, Pullman, Washington. The technical contributions of Garrison King and Barbara C. Davis, Washington State University Laboratory Technicians II and I, respectively, is gratefully acknowledged. This work was supported by grant funds from the Washington State Department of Agriculture.

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INTRODUCTION

This is the Forty-fifth Annual report of the Western Wheat Quality Laboratory of cooperative investigations with breeders, geneticists, pathologists, and other scientists to evaluate the milling and baking quality characteristics of experimental wheat selections grown and harvested as the 1992 crop. The primary purpose of this work is to develop new wheat cultivars with improved performance. These investigations include several market classes and sub-classes of wheat that are commercially grown in the Pacific Northwest and the Western Region and relate to wheat quality for commercial production and consumer acceptance. These studies deal with the physical and chemical flour properties associated with a cultivar's suitability for commercial pastry, noodle, and bread products. Results are provided to each cooperator as completed. Cooperators include Drs. Allan (USDA), Donaldson (WSU), Hole (Utah), Jones (USDA), Kolding (OSU), Konzak (WSU), Kronstad (OSU), Line (USDA), Peterson (WSU), Qualset (UC-Davis), Rhode (OSU) and Zwer (OSU). The University of Idaho wheat breeding program, Drs. Zemetra (Moscow) and Souza (Aberdeen), is supported by the testing of experimental lines in interstate nurseries, and the Western Regional Nurseries. In addition to these cooperators at public institutions, private breeders are assisted on a "resource-available" basis. It is important for the USDA ARS to be aware of the quality of new private cultivars before they reach significant production levels. The data on these private experimental lines are freely distributed and are included here. Private breeders included Lewis and Pope.

The results of testing and evaluation are managed and arranged by a nursery system (NURSERY, see Index of Nurseries) and the cultivars and selections are listed in the tables in order of their assigned laboratory identification number (SAMPLE#). A description of all methods used to determine physical/chemical, milling, and baking quality is provided in the Methods section (Appendix B). Mixograms are generally not reproduced in this report. Alternatively, each mixogram is characterized by type as described in the Methods section and Interpretation of Data section (Appendix C).

NEW DEVELOPMENTS

Color is one of several important considerations in the assessment of flour quality, particularly in regards to the quality of the end product. Color represents an extremely important quality criterion in Asian types of noodles. They must have an attractive appearance at the time of manufacture, after a day or more of storage and after boiling. There are two distinct aspects of color; brightness (or freedom from discoloration) and yellowness. A new test, an alkaline Pekar slick, was developed and added to subjectively measure flour color. Alkaline flour color is scored only on SWW, HWW, SWS and HWS flours which have a minimum RVA viscosity of 150 and a minimum NIR wheat hardness value of 40.

In order to provide milling data for small quantity samples (40-100g) a short flow Quadrumat milling system was adopted. Conditioned wheat is ground only through the Quadrumat break rolls. The meal is then sifted as per the standard procedure for the modified Quadrumat Senior break side.

Samples are atmospherically conditioned (tempered) in the envelopes in which they are recieved. Envelopes are placed in a chamber where temperature and relative humidity are set to raise the moisture of the wheat to a desired level (13.0%-soft wheat & 14.5%-hard wheat).

The break flour produced is generally sufficient for physical-chemical predictive tests which require little flour (i.e. mixogram, Rapid Visco Analyzer (RVA) viscosity, Brookfield viscosity or AWRC).

SPECIFIC PROJECTS

As usual, the WWQL participated in the Western Regional Nursery Project by conducting the quality evaluations (NURSERY nos. 110-113). Results also appear in *"1992 Results from Cooperative Experiments in the Western Region,"* R.E. Allan and C.J. Peterson, Jr.

A sample variety "Quantum 542" was evaluated for J. Proctor (NURSERY no. 65).

Considerable effort was devoted to the evaluation of hard white wheat, both spring and winter types. To gain a better assessment of potential end-use quality, an overseas collaborative testing program was developed in cooperation with U.S. Wheat Assoc., Portland, and regional breeders and agronomists.

WHEAT ANALYSIS NURSERIES - CROP YEAR 92

NURSERY#	NURSERY IDENTIFICATION	LOCATION	BREEDER	SAMPLES
002	Preliminary HRS 83 Q	Royal Slope, WA	C.F. Konzak	0018
003	Preliminary HRS 81 Q	Royal Slope, WA	C.F. Konzak	0020
004	Single Plot Red (HRS) Q	Royal Slope, WA	C.F. Konzak	0069
006	Anthr Culture-2 Q	Pullman	C.J. Peterson	0056
007	Anthr Culture Q	Pullman, WA	C.J. Peterson	0054
008	State SW Q	Walla Walla, WA	C.J. Peterson	0132
009	WINTER GRAIN YIELD TRIAL W	MORO, OR	P.K. ZWER	0036
010	WINTER GRAIN YIELD TRIAL W	PENDLETON, OR	P.K. ZWER	0036
013	ADVANCED CLUB YIELD TRIAL Q	MORO, OR	P.K. ZWER	0030
014	PRELIMINARY CLUB WHEAT Y.T. #1 Q	PENDLETON, OR	P.K. ZWER	0028
015	PRELIMINARY CLUB WHEAT Y.T. #2 Q	PENDLETON, OR	P.K. ZWER	0015
016	PRELIMINARY CLUB WHEAT Y.T. #3 Q	PENDLETON, OR	P.K. ZWER	0015
017	PRELIMINARY CLUB WHEAT Y.T. #4 Q	PENDLETON, OR	P.K. ZWER	0022
018	PRELIMINARY CLUB WHEAT Y.T. #5 Q	PENDLETON, OR	P.K. ZWER	0025
019	PRELIMINARY CLUB WHEAT Y.T. #6 Q	PENDLETON, OR	P.K. ZWER	0017
020	PRELIMINARY CLUB WHEAT Y.T. #7 Q	PENDLETON, OR	P.K. ZWER	0029
021	FOOT ROT RESISTANT LINES (pre rain) Q	PENDLETON, OR	C. RHODE	0022
022	EARLY GEN ADVANCED CLUB HEADROWS #1 W	PENDLETON, OR	P.K. ZWER	0000 -- See Nursery 146 --
023	EARLY GEN ADVANCED CLUB HEADROWS #2 W	PENDLETON, OR	P.K. ZWER	0000 -- See Nursery 146 --
024	HARD WHITE WINTER Q	PULLMAN, WA	C.J. PETERSON	0056
025	HARD WHITE WINTER Q	DUSTY, WA	C.J. PETERSON	0048 -- Low Test Weight -- Deleted
026	FOOT ROT RESISTANT LINES (post rain) Q	PENDLETON, OR	C. RHODE	0010
027	ADVANCED CLUB WHEAT YIELD TRIAL Q	PENDLETON, OR	P.K. ZWER	0030
028	ELITE CLUB WHEAT YIELD TRIAL (quad) Q	MORO, OR	P.K. ZWER	0016
029	ELITE CLUB WHEAT YIELD TRIAL (buhler) B	MORO, OR	P.K. ZWER	0021
030	ELITE CLUB WHEAT YIELD TRIAL (quad) Q	PENDLETON, OR	P.K. ZWER	0016
031	ELITE CLUB WHEAT YIELD TRIAL (buhler) B	PENDLETON, OR	P.K. ZWER	0021
032	ELITE WINTER WHEAT TRIAL #F2095 B	HERMISTON, OR	M.F. KOLDING	0007
033	WINTER WHEAT TRIAL #B2086 Q	HERMISTON, OR	M.F. KOLDING	0005
034	WINTER WHEAT TRIAL-H EXPERIMENTS Q	HERMISTON, OR	M.F. KOLDING	0060
035	WINTER WHEAT TRIAL #2047 Q	HERMISTON, OR	M.F. KOLDING	0008
036	WINTER WHEAT TRIAL #H2007 Q	HERMISTON, OR	M.F. KOLDING	0005
039	1992 RED RIVER BIOTYPES Q	PULLMAN, WA	S. JONES	0008
041	91612 SUBSTITUTION LINES (T. tauschii) Q	TULELAKE, CA	S. JONES	0041
042	91701 SUBSTITUTION LINES (CHEYENNE 1D) Q	TULELAKE, CA	S. JONES	0166
043	ADVANCED SOFT WHITE SPRING 66 B	PULLMAN, WA	C.F. KONZAK	0012
044	STATE SOFT WHITE SPRING 52 B	PULLMAN, WA	C.F. KONZAK	0021
045	PRELIMINARY SOFT WHITE SPRING 71 Q	PULLMAN, WA	C.F. KONZAK	0015
046	PRELIMINARY SOFT WHITE SPRING 72 Q	PULLMAN, WA	C.F. KONZAK	0017
047	STATE HARD RED SPRING 47 B	ROYAL SLOPE, WA	C.F. KONZAK	0017
048	ADV HARD WHITE SPRING 69 B	ROYAL SLOPE, WA	C.F. KONZAK	0008
049	ADV HARD RED SPRING NURS 86 Q	ROYAL SLOPE, WA	C.F. KONZAK	0023
050	PREL. HARD RED SPRING NURS 82 Q	ROYAL SLOPE, WA	C.F. KONZAK	0020
051	TRISTATE SPRING WHEAT NURS 48 (HARD) Q	ROYAL SLOPE, WA	C.F. KONZAK	0020
052	UNIFORM REGIONAL HRS Q	PULLMAN, WA	C.F. KONZAK	0010
053	TRISTATE SPRING WHEAT NURS 48 (SOFT) Q	PULLMAN, WA	C.F. KONZAK	0016
054	HARD WHEAT ELITE B	PULLMAN, WA	C.F. KONZAK	0032
055	HARD RED & WHITE MISC. Q	CORVALLIS, OR	W.E. KRONSTAD	0012
056	HARD RED REPLICATED ADVANCE Q	CORVALLIS, OR	W.E. KRONSTAD	0048
057	HARD WHITE REPLICATED ADVANCE Q	CORVALLIS, OR	W.E. KRONSTAD	0029
058	HARD WHITE REPLICATED PRELIMINARY Q	CORVALLIS, OR	W.E. KRONSTAD	0020
059	SOFT WHITE ELITE B	CORVALLIS, OR	W.E. KRONSTAD	0024
060	SOFT WHITE MISCELLANEOUS Q	CORVALLIS, OR	W.E. KRONSTAD	0008

061	SOFT WHEAT REPLICATED ADVANCE	Q	CORVALLIS, OR	W.E. KRONSTAD	0080
062	SOFT WHEAT REPLICATED PRELIMINARY	Q	CORVALLIS, OR	W.E. KRONSTAD	0033
063	HARD SPRING WHEAT DRILL STRIPS	B	PENDLETON, OR	W.E. KRONSTAD	0006
064	WINTER WHEAT QUALITY CROSSING BLOCK	Q	CORVALLIS, OR	W.E. KRONSTAD	0034
065	QUANTUM 542	Q	REARDAN, WA	J. PROCTOR	0001
066	DOUBLE HAPLOID SINGLE PLOT HRS	Q	PULLMAN, WA	C.F. KONZAK	0040
067	SINGLE PLOT WHITE SPRING	Q	PULLMAN, WA	C.F. KONZAK	0047
068	ADVANCED HARD WHITE SPRING	Q	BELLINGHAM, WA	M. LEWIS	0003
069	ADVANCED SOFT WHITE SPRING	Q	BELLINGHAM, WA	M. LEWIS	0004
070	STATE SWW	5Q	RITZVILLE, WA	C.J. PETERSON	0128
073	SPRING CLUBS	B	VARIOUS	C.F. KONZAK	0012
075	SOFT WHITE WINTER LINES	B	CORVALLIS, OR	W.E. KRONSTAD	0002
076	WALLA WALLA CROP LOSS 1992	Q	WALLA WALLA, WA	R.F. LINE	0026
077	WHITLOW CROP LOSS 1992	Q	WHITLOW, WA	R.F. LINE	0032
078	WHITLOW HTAP 1992	Q	WHITLOW, WA	R.F. LINE	0014
079	UTAH DRYLAND HRW	Q	BLUECREEK, UT	D. HOLE	0063
088	UTAH IRRIGATED HRW	Q	LOGAN, UT	D. HOLE	0008
090	ADVANCED CLUBS	Q	FRT	R.E. ALLAN	0020
091	ADVANCED CLUBS	Q	PULLMAN LATE	R.E. ALLAN	0020
092	ADVANCED CLUBS	Q	WALLA WALLA	R.E. ALLAN	0020
093	NEW CLUBS X COMMONS	Q	FRT	R.E. ALLAN	0031
094	NEW CLUBS X COMMONS	Q	PULLMAN LATE	R.E. ALLAN	0031
095	NEW CLUBS X COMMONS	Q	WALLA WALLA	R.E. ALLAN	0031
096	ADVANCED COMMONS	Q	FRT	R.E. ALLAN	0011
097	ADVANCED COMMONS	Q	PULLMAN LATE	R.E. ALLAN	0011
098	ADVANCED COMMONS	Q	WALLA WALLA	R.E. ALLAN	0011
099	WA7671 RESELECTIONS	B	PULLMAN	R.E. ALLAN	0009
100	LUKE NILS	Q	PULLMAN EARLY	R.E. ALLAN	0020
101	LUKE NILS	Q	PULLMAN LATE	R.E. ALLAN	0020
102	LUKE NILS	Q	WALLA WALLA	R.E. ALLAN	0020
103	ELITE HARD WHITE SPRING	B	PENDLETON, OR	W.E. KRONSTAD	0026
104	OBSERVATION NURSERY EXP. #92023	Q	DAVIS, CA	C.O. QUALSET	0010
105	OBSERVATION NURSERY EXP. #92024	Q	DAVIS, CA	C.O. QUALSET	0014
106	OBSERVATION NURSERY EXP. #92039	Q	DAVIS, CA	C.O. QUALSET	0020
107	SOFT WHITE SPRING WHEAT QUALITY	Q	PENDLETON, OR	W. KRONSTAD	0016
108	HARD RED SPRING QUALITY	Q	PENDLETON, OR	W. KRONSTAD	0116
109	HARD WHITE SPRING QUALITY	Q	PENDLETON, OR	W. KRONSTAD	0080
110	WESTERN REGIONAL SOFT WHITE WINTER	B	VARIOUS	W. KRONSTAD	0043
111	WESTERN REGIONAL HARD RED WINTER	B	VARIOUS		0038
112	WESTERN REGIONAL HARD SPRING	B	VARIOUS		0027
113	WESTERN REGIONAL SOFT WHITE SPRING	B	VARIOUS		0013
115	1992 F4'S	Q	PULLMAN, WA	R.E. ALLAN/S.S. JONES	0102
116	ADVANCED CLUB AND COMMONS	B	PULLMAN, WA (FRT)	R.E. ALLAN	0019
117	ADVANCED CLUB AND COMMONS	B	WALLA WALLA, WA	R.E. ALLAN	0019
118	STATE HRW SERIES I (UNWEATHERED)	Q	LIND, WA	E. DONALDSON	0022
119	STATE HRW SERIES I (WEATHERED)	SQ	LIND, WA	E. DONALDSON	0022
120	ADVANCED HRW SERIES I (UNWEATHERED)	Q	LIND, WA	E. DONALDSON	0052
121	ADVANCED HRW SERIES I (WEATHERED)	SQ	LIND, WA	E. DONALDSON	0051
123	SPRING CLUBS		PULLMAN	C.F. KONZAK/B. MILLER	0014
128	ADV. HRW 5 (LIND PRE-IRRIGATED EARLY)	Q	LIND, WA	E. DONALDSON	0022
129	PREL. HRW 1-10 DRYLAND (UNWETTED)	Q	LIND, WA	E. DONALDSON	0084
130	PREL. HRW 11-22 IRRIGATED (WEATHERED)	Q	LIND, WA	E. DONALDSON	0112
131	PREL. HRW 23-PLUS IRRIGATED(WEATHERED)	Q	LIND, WA	E. DONALDSON	0078
132	YA ANOTHER CULTURE (LIND DRYLAND EARLY)	Q	LIND, WA	E. DONALDSON	0016
133	YB ANOTHER CULTURE(LIND IRRIGATED LATE)	Q	LIND, WA	E. DONALDSON	0012
134	CONNELL 1992 EXTENSION CLUBS	Q	LIND, WA	E. DONALDSON	0028
135	CLUB MIXTURE YIELD TRIAL - Exp 262	Q	PENDLETON, OR	P. ZMER	0005

136	CLUB MIXTURE YIELD TRIAL - Exp 262	B	PENDLETON, OR	P. ZWER	0011
137	CLUB MIXTURE YIELD TRIAL - Exp 243	Q	MORO, OR	P. ZWER	0005
138	CLUB MIXTURE YIELD TRIAL - Exp 243	B	MORO, OR	P. ZWER	0011
139	CAMAS WHEAT BREEDING QUAD SAMPLES	Q	MOSCOW, ID	W. POPE	0006
140	NEAR ISOGENIC LINES (SPRING GROWTH HAB)	B		S. JONES/R.E. ALLAN	0040
141	HESSIAN FLY RESISTANT VARIETIES	Q	ROYAL SLOPE AND PULLMAN	C. KONZAK	0006
142	SINGLE PLOT WHITE II	W	PULLMAN, WA	C.F. KONZAK	0065
145	ADVANCED CLUBS	Q	PULLMAN, WA	R.E. ALLAN	0005
146	ADVANCED CLUB HEADROWS	W	PENDLETON, OR	P.K. ZWER	0461
147	ISRAEL WHEATS	Q	PULLMAN, WA/ ISRAEL	C.F. KONZAK	0029
149	COMMERICAL SPRING WHEAT	Q	ROYAL SLOPE, WA	M. DAVIS	0010
150	PROTEIN/ISRAEL	W		C.F. KONZAK	0013
151	RVA EVALUATION OF HWS WHEAT	F	ABERDEEN, ID	E. SOUZA	0024
156	SHW EARLY GENERATION NURSERY	SQ	PULLMAN, WA	C.J. PETERSON	0607

NOTE: The following nurseries were used to catalog and survey grain samples used for a hard white collaborative testing program. They appear as a group after nursery 156. Also included is the report, Report on the 1992 - Crop Hard White Collaborative Testing Program which summarizes the results of that program.

082	HARD WHITE OVERSEAS TESTING	W	PULLMAN, WA	C.F. KONZAK	0021
083	HARD WHITE OVERSEAS TESTING	W	ABERDEEN, ID	E. SOUZA	0006
084	HARD WHITE OVERSEAS TESTING	W	CORVALLIS, OR	W.E. KRONSTAD	0009
085	HARD WHITE OVERSEAS TESTING	W	PULLMAN, WA	B. MILLER	0019
086	HARD WHITE OVERSEAS TESTING	W	PULLMAN, WA	C.F. KONZAK	0007
122	HARD WHITE OVERSEAS TESTING	W		E. DONALDSON	0002
125	HARD WHITE OVERSEAS SAMPLES	Q	VARIOUS		0013

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0001	.	3	HRS		74	10.2 -2						
0002	.	5	HRS		61	9.9 -2						
0003	.	6	HRS	60.5 -	76	12.2 -	67.9 +2	34.2	0.35	85.0 +	10.6 -	62.5
0004	.	7	HRS	60.8	84	12.7 -	68.3 +2	30.6	0.35	85.4 +	11.2	59.7 -
0005	.	9	HRS	60.4 -	64	12.2 -	67.9 +2	33.0	0.35	85.0 +	10.6 -	55.9 -2
0006	.	10	HRS	61.4	70	12.1 -	67.5 +	29.4	0.39 -2	82.5	11.2	57.3 -2
0007	.	13	HRS	59.7 -	67	12.6 -	68.5 +2	33.3	0.32 +	87.2 +2	11.4	57.3 -2
0008	.	19	HRS	62.3	74	12.6 -	65.8	31.9	0.34	83.3	11.2	58.3 -
0009	.	21	HRS	62.1	66	13.5	64.8	29.7	0.34	82.3	12.1	63.1
0010	.	23	HRS	62.6	83	14.6	65.8	25.6	0.39 -2	80.7 -	12.6	64.2
0011	.	24	HRS	60.5 -	82	13.5	66.8 +	29.2	0.35	83.9	12.1	60.7
0012	.	25	HRS	61.7	81	12.2 -	66.6 +	29.9	0.34	84.2	10.8 -	58.7 -
0013	.	26	HRS	61.4	80	13.5	63.0 -2	26.8	0.34	80.4 -	12.2	60.8
0014	.	27	HRS	60.2 -	67	11.6 -	67.7 +2	35.4	0.35	84.8	10.1 -	59.3 -
0015	.	28	HRS	61.1	61	11.6 -	67.1 +	32.3	0.36 -	83.7	10.5 -	58.8 -
0016	.	30	HRS	61.4	76	13.2	63.3 -	26.7	0.37 -	79.2 -	11.5	60.3 -
0017	SUNSTAR II	31	HRS	63.8	67	13.2	69.3 +2	32.4	0.33	87.5 +2	11.9	63.4
*0018	906R	33	HRS	62.3	68	14.3	65.3	27.8	0.34	82.8	12.5	63.2

* = standard mean nursery flour protein = 11.4 mill used = Quad

Standard Mean

Nursery Mean

Nursery Standard deviation

HRS	62.3	68	14.3	65.3	27.8	0.34	82.8	12.5	63.2
HRS	61.4	72	12.5	66.6	30.5	0.35	83.6	11.4	60.2
HRS	1.06	7.6	1.23	1.82	2.87	0.019	2.29	0.77	2.50

SAMPLE#	BREEDER#	MTYPE	BABS	MTIME	LVOL	BCRGR	PROQ
0001	3						
0002	5						
0003	6	4H	63.7	3.9	900 -2	4	+1
0004	7	3M	61.9 -	3.0	925 -2	4	+1
0005	9	2M	57.1 -2	2.0	845 -2	6	0
0006	10	3H	61.5 -	4.1	875 -2	5	0
0007	13	3H	60.5 -2	2.5	995	3	+1
0008	19	3H	62.5 -	3.3	1015	3	+1
0009	21	3H	67.3	3.5	940 -2	5	0
0010	23	4H	66.4	4.1	945 -	5	0
0011	24	2H	64.9	2.6	925 -2	6	0
0012	25	2H	61.9 -	2.6	870 -2	6	+1
0013	26	3H	66.0	2.8	915 -2	5	0
0014	27	3M	61.5 -	2.5	805 -2	4	0
0015	28	3H	62.0 -	3.1	895 -2	5	+1
0016	30	3H	65.5	3.3	860 -2	6	-1
0017	31	2H	65.6	2.6	1005	2	+1
*0018	33	3H	65.4	2.9	1025	2	+1

* = standard mean nursery flour protein = 11.4 mill used = Quad

HRS	65.4	2.9	1025	2
HRS	63.4	3.0	921	4
HRS	2.70	0.61	64.3	1.4

COMMENTS: Selections were initially screened for adequate wheat hardness and protein content. Those with wheat hardness values below 50 and/or wheat protein less than about 10.5% were excluded from further testing.

SAMPLE#	BREEDER#	MTYPE	BABS	MTIME	LVOL	BCRGR	PROQ	RVA*	COLOR*
0001	1	4H	67.2	4.2	975	3	0		
0002	6	2H	65.0	2.8	900 -2	4	-1		
0003	9	2H	63.9 -	3.0	925 -	4	0		
0004	12	2H	66.9	2.4	1010	4	0		
0005	13	3H	66.0	3.1	925 -	5	-1		
0006	17	6M	62.9 -	5.0 +	890 -2	5	0		
0007	19	3H	71.6 +2	2.9	1040 +	4	-1		
0008	20	2H	66.7	2.1	950	4	-1		
0009	21	2H	66.9	2.9	940 -	4	0		
0010	22	2H	64.7	2.0	940 -	6	-1		
0011	23	6M	65.9	4.2	945	4	+1		
0012	30	2H	65.0	2.5	955	6	0		
0013	32	4H	67.2	4.1	875 -2	6	0		
0014	39	2H	68.9	2.5	1025	2	0		
0015	40	2H	63.3 -	2.2	945	5	0		
0016	41	4H	65.8	4.2	1025	2	+1		
0017	42	3H	65.7	2.9	960	4	0		
0018	45	4H	64.5 -	3.1	1000	3	0		
*0019	47	3H	66.8	2.9	985	3	+1		
0020	48	4H	66.8	3.9	1115 +2	2	+1	285	U

* = standard mean nursery flour protein = 12.7 mill used = Quad

HRS
HRS
HRS

HRS
HWS
HWS

COMMENTS: *RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable.

*Color represents an extremely important quality criterion in Asian types of noodles. A preliminary alkaline flour color test was initiated. An alkaline Pekar slick was used to subjectively measure flour color. The Pekar slick was prepared by pressing flour to a smooth surface, immersing in a 1.0% alkaline solution consisting of 60% K₂CO₃ and 40% Na₂CO₃ for 2 minutes. The sample rested at a room temperature of (77°F) for 4 hours before visual observation and scoring. Flours were scored by the following; S = satisfactory, Q = questionable, and U = unsatisfactory. Desirable flour color ranges from bright white through creamy yellow to bright yellow. Any dullness, brown, or greenish casts would be unacceptable.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0001	SPILLMAN	1	HRS	62.2	79	11.8	65.8	29.6	0.37	81.8	10.8	60.3
0002		2	HRS	62.7	82	12.2	66.5	27.0	0.35	83.6	10.4	56.0 -
0003		10	HRS	60.2 -	77	13.6	61.4 -2	24.8	0.40 -2	75.6 -2	11.3	58.8
*0004		11	HRS	62.5	73	12.5	67.6	30.4	0.35	84.7	10.7	61.0
0005		12	HRS	60.2 -	78	13.3	61.9 -2	24.2	0.38 -	77.2 -2	11.4	58.0 -
0006	SPILLMAN	14	HRS	62.2	70	12.3	66.5	29.8	0.34	84.1	11.5	56.0 -
0007		15	HRS		69	10.6 -						
0008		19	HRS	61.1	82	11.2	66.2	29.0	0.35	83.2	9.6	58.7
0009		20	HRS	61.1	66	13.2	68.1 +	29.7	0.36	84.7	11.4	61.8
0010		23	SRS	60.8	28	11.9						
0011	SPILLMAN	25	HRS		77	10.2 -						
0012		26	SRS		45	11.5						
0013		29	HRS	59.1 -	76	12.6	66.1	30.0	0.38 -	81.6	10.9	60.1
0014		32	HRS	61.1	85	13.3	65.6 -	28.2	0.38 -	81.1 -	11.8	64.6 +
*0015		33	HRS	62.2	78	11.2	67.0	30.1	0.35	84.1	10.3	61.1
0016	SPILLMAN	35	HRS	61.9	79	11.8	67.8	32.8	0.36	84.4	10.5	59.1
0017		36	HRS		71	10.3 -						
0018		41	HRS	61.6	63	11.9	68.6 +	29.6	0.37	84.7	10.7	61.6
0019		42	HRS	62.2	79	11.2	65.1 -	27.9	0.35	82.1	9.9	58.7
0020		45	HRS		76	10.4 -						
0021	SPILLMAN	46	HRS	61.9	76	11.6	66.8	29.0	0.37	82.8	10.5	60.0
*0022		55	HRS	64.1 +	80	11.8	66.4	30.1	0.35	83.5	10.7	63.1
0023		56	HRS	61.9	67	11.7	68.2 +	32.0	0.34	85.9 +	10.5	59.6
0024		59	HRS	61.9	64	13.1	66.5	31.6	0.32 +	85.1	11.2	61.9
0025		61	HRS	62.2	75	11.9	66.7	29.1	0.37	82.7	10.3	62.1
0026	SPILLMAN	63	HRS	61.3	69	11.9	68.4 +	26.3	0.36	85.0	10.4	61.2
0027		71	HRS	62.2	71	12.8	64.9 -	29.1	0.30 +2	84.5	10.6	61.3
0028		73	HRS	61.3	73	12.0	65.6 -	27.5	0.38 -	81.1 -	10.5	64.0
0029		74	HRS	61.3	80	13.1	65.9	30.8	0.33 +	84.0	11.3	61.1
0030		75	HRS	63.0	80	11.9	67.0	29.2	0.35	84.1	9.9	59.3
0031	SPILLMAN	76	HRS	61.6	82.	12.8	68.6 +	32.2	0.37	84.7	10.3	60.3
*0032		77	HRS	61.6	73.	12.6	67.2	29.7	0.36	83.8	11.0	61.2
0033		78	HRS	61.1	59.	12.8	67.7	30.3	0.37	83.8	11.0	62.2
0034		84	HRS	63.9	79.	12.8	65.1 -	27.0	0.38 -	80.5 -	10.8	63.4
0035		86	HRS	61.6	87.	13.8 +	64.9 -	27.8	0.35	81.9	12.2 +	63.5
0036	SPILLMAN	87	HRS	61.9	94.	12.0	64.3 -2	25.0	0.37	80.2 -	10.5	60.3
0037		89	HRS	61.6	93.	12.8	64.9 -	22.2	0.35	81.9	11.0	61.2
*0038		99	HRS	61.9	80.	12.6	66.9	29.8	0.36	83.5	10.5	61.1
0039		109	HRS	60.5 -	85.	12.8	66.5	30.5	0.33 +	84.6	11.2	60.1
0040		114	HRS		74.	9.9 -						

* = standard mean nursery flour protein = 10.9 mill used = Quad

SAMPLE#	BREEDER#	MTYPE	BABS	MTIME	LVOL	BCRGR	PROQ
0001	1	6M	63.5	3.3	935	4	+1
0002	2	3M					
0003	10	2H	63.0	2.3	850 -2	6	0
*0004	11	4H	64.2	3.2	940	4	+1
0005	12	2H					
0006	14	3M					
0007	15						
0008	19	8M	63.9	5.3 +	785 -2	6	0
0009	20	3H	65.0	3.6	940	3	+1
0010	23						
0011	25						
0012	26						
0013	29	3M					
0014	32	4H	66.8 +	3.5	955	2	+1
*0015	33	3H	66.3	3.2	890 -	4	+1
0016	35	3M					
0017	36						
0018	41	4H	65.8	3.5	965	4	+1
0019	42	2H					
0020	45						
0021	46	2H	64.2	2.4	955	6	+1
*0022	55	3H	65.3	3.4	970	3	+1
0023	56	6M	63.8	4.6 +	935	4	+1
0024	59	3H	65.1	4.1	970	5	+1
0025	61	5M	67.3 +	3.5	895 -	5	+1
0026	63	4M					
0027	71	7M	66.5	4.4 +	925	6	+1
0028	73	5H	68.2 +	5.6 +	985 +	3	+1
0029	74	3H	65.3	2.8	965	5	+1
0030	75	4M	64.5	3.3	880 -	6	+1
0031	76	6M	64.5	3.6	960	4	+1
*0032	77	2H	64.9	2.9	990 +	3	+1
0033	78	4H	66.4	4.7 +	885 -	3	+1
0034	84	4H	69.6 +2	4.2	985 +	4	+1
0035	86	4H	67.7 +	3.9	1050 +2	3	+1
0036	87	3H	64.5	3.5	940	5	+1
0037	89	4H	66.4	3.2	890 -	4	+1
*0038	99	2H	65.3	2.5	950	4	+1
0039	109	2H					
0040	114						

* = standard mean nursery flour protein = 10.9 mill used = Quad

SAMPLE#	BREEDER#	MTYPE	BABS	MTIME	LVOL	BCRGR	PROQ
0041	116	5H	68.5 +	4.2	925	5	+1
0042	120	2H	68.3 +	2.9	940	4	+1
*0043	121	2H	64.3	2.3	990 +	3	+1
0044	125						
0045	126	2H	65.2	3.1	945	4	+1
0046	127	3H	63.7	2.5	855 -2	6	0
0047	128	4H	67.4 +	4.1	935	4	+1
0048	129	3H	67.4 +	4.0	970	5	+1
0049	130	3H	66.5	3.3	985 +	4	+1
0050	133	3H	67.5 +	3.1	950	4	+1
0051	137	4H	67.3 +	4.7 +	1040 +2	4	+1
0052	139	2H					
0053	140	2H	65.2	4.1	1035 +2	2	+1
0054	141	3H	64.0	3.2	940	4	+1
0055	142						
*0056	143	3H	62.7	3.2	910	4	+1
0057	144	4H	65.3	2.8	950	4	+1
0058	145	2H					
0059	146	4M	64.2	3.3	860 -2	5	+1
0060	148	2H	62.2	2.1	945	4	0
0061	149	7M	62.0 -	4.2	850 -2	6	+1
0062	150	4M	61.9 -	3.1	1000 +	3	+1
0063	151	3M					
0064	152	4M	60.8 -	3.2	1005 +	2	+1
0065	155	8M	66.8 +	6.8 +2	915	4	+1
0066	156	4H	66.7	5.0 +	975	4	+1
0067	157						
0068	158	3M					
*0069	159	3H	62.2	3.3	900 -	3	+1

* = standard mean nursery flour protein = 10.9 mill used = Quad

HRS	64.4	3.0	942	4
HRS	65.3	3.6	941	4
HRS	1.97	0.92	52.7	1.1
HRS	64.4	3.0	942	4
SRS				

Comments: Selections were initially screened for adequate wheat hardness and protein content. Those with hardness values below 50 and/or wheat protein content of about 10.6% or less were excluded from further testing. Also a few lines were excluded from bread baking due to poor mixogram type (ie. shot mixing time, weak mixing properties etc.).

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
*0001	COULEE	1	HRW	58.6	65	12.1	67.6	31.4	0.29	87.8	10.1	59.4
*0002	STEPHENS	2	SWW	57.8	27	11.3	67.9	37.1	0.38	83.4	9.0	56.1
0003	WA7679	3	HRW	60.1	66	12.7	66.5	33.2	0.29	86.7	10.7	63.4 +
0004	D89029.3	4	HRW	60.5 +	63	12.9	60.0 -2	28.5	0.30	79.4 -2	10.3	58.9
0005	D89031.14	5	HRW	58.1	51	12.9	65.7 -	28.7	0.36 -2	82.2 -2	10.9	61.5
0006	D89031.15	6	SRW	58.3	48	12.6	65.7 -2	29.1	0.34 +	83.1	11.4 -	57.8
0007	D89031.16	7	HRW	58.2	51	13.3	68.1	30.2	0.32 -	86.8	11.4	64.3 +
0008	D89031.17	8	HRW	60.2	57	12.2	66.8	31.3	0.31 -	86.0	10.4	61.5
0009	D89031.18	9	HRW		60	9.7 -						
0010	D89032.7	10	HRW	60.8 +	72	13.8 +	64.0 -2	29.3	0.34 -2	81.5 -2	12.2 +	63.4 +
0011	D89032.26	11	HRW		62	10.0 -						
0012	D89032.29	12	HRW	61.6 +	51	11.9	64.1 -2	28.8	0.33 -2	82.1 -2	10.2	60.3
0013	D89032.30	13	HRW	59.7	65	11.3	66.5	31.3	0.33 -2	84.6 -	9.2	58.4
0014	D89032.31	14	HRW	59.6	66	12.6	64.4 -2	25.4	0.39 -2	79.3 -2	10.2	60.2
0015	D89032.38	15	HRW		59	10.0 -						
0016	D89032.39	16	HRW	59.9	54	10.9	65.9 -	31.8	0.33 -2	84.0 -	9.8	59.7
0017	D89032.40	17	HRW	59.4	69	11.5	64.8 -2	29.6	0.34 -2	82.3 -2	9.6	59.4
0018	D89032.41	18	HRW	60.2	73	14.3 +	63.5 -2	26.9	0.34 -2	80.9 -2	11.9 +	62.7 +
0019	D89032.42	19	HRW	60.5 +	79	13.2	64.7 -2	28.5	0.29	84.8 -	11.7 +	61.8
0020	D89032.46	20	HRW	58.0	52	11.2	65.8 -	28.9	0.32 -	84.4 -	9.7	59.4
0021	D89034.3	21	HRW	58.7	60	11.7	64.7 -2	33.0	0.30	84.3 -	10.4	60.8
0022	D89036.1	22	HRW	60.1	80	13.2	64.6 -2	27.0	0.38 -2	80.0 -2	11.7 +	62.4 +
0023	D89036.3	23	HRW	58.8	67	13.5	62.1 -2	28.5	0.32 -	80.5 -2	11.7 +	62.3 +
0024	D90012.1	24	HRW	59.8	73	12.2	67.7	31.3	0.32 -	86.4	10.3	61.4
0025	HW89110.1	25	HRW	60.0	70	11.3	62.1 -2	29.8	0.30	81.6 -2	8.9	58.5
0026	HW89110.2	26	HRW	59.9	55	10.8	62.2 -2	29.5	0.31 -	81.2 -2	8.1 -	59.5
0027	HW89110.3	27	HRW	60.6 +	66	11.6	62.7 -2	28.0	0.34 -2	80.1 -2	8.9	58.5
0028	HW89120.1	28	HRW	60.3 +	62	11.1	65.2 -2	32.6	0.34 -2	82.7 -2	9.1	58.4
0029	HW89120.2	29	HRW	59.7	68	12.4	63.8 -2	29.4	0.33 -2	81.8 -2	10.1	60.2
0030	HW89120.4	30	SRW	59.6 +	48	11.4	64.5 -2	35.5	0.31 +2	83.5	8.4	60.8 -
0031	HW89131.1	31	HRW		62	10.1 -						
0032	HW89171.1	32	HRW	59.4	50	12.0	65.0 -2	32.0	0.30	84.6 -	9.6	60.4
0033	HW89034.1	33	HRW	58.0	51	10.4 -	64.5 -2	36.4	0.35 -2	81.5 -2	9.0	58.4
0034	HW89034.2	34	SWW	57.9	43	10.5	64.1 -2	35.6	0.35 +	80.4 -	7.4 +	55.7
0035	HW89074.1	35	SWW	56.4	15	10.6	59.7 -2	41.3	0.29 +2	78.7 -2	6.9 +	52.1 +
0036	HW89118.1	36	HRW	59.9	70	12.2	66.2 -	30.9	0.33 -2	84.3 -	10.5	60.4
0037	HW89178.1	37	HRW	57.9	51	12.4	63.6 -2	33.6	0.30	83.1 -2	9.3	58.1
0038	HW89178.2	38	HRW	58.2	58	12.3	62.6 -2	30.4	0.31 -	81.6 -2	9.5	58.3
0039	V87301	39	HRW	58.0	79	13.7 +	62.4 -2	30.5	0.33 -2	80.3 -2	11.4	60.1
0040	V89347.1	40	SRW		13	12.8						

* = standard mean nursery flour protein = 9.6 mill used = Quad

SAMPLE#	BREEDER#	MTYPE	CODI	TGS	BABS	MTIME	LVOL	BCRGR	PROQ	RVA	COLOR*
*0001	1	2M	8.40	6	65.6	1.8	890	6	+1	197	Q
*0002	2	2M	9.34	9						188	
0003	3	4M	8.40	6	65.6	3.0	885	6	+1	192	S
0004	4	2M			61.1 -	2.0	800 -2	8	0		
0005	5	3H			62.7 -	3.2 +	945 +	5	+1		
0006	6	4M			59.0	3.1	935 +2	5	+1		
0007	7	5H			65.5	6.4 +2	930	4	+1		
0008	8	6M			63.7	4.7 +2	895	4	+1		
0009	9										
0010	10	2H			65.6	2.5	950 +	4	0		
0011	11										
0012	12	5M			62.5 -	3.6 +	890	5	+1		
0013	13	4M			60.6 -2	4.5 +2	830 -	6	+1		
0014	14	8M			62.4 -	4.5 +2	795 -2	7	0		
0015	15										
0016	16	8M			60.9 -2	5.0 +2	840 -	5	+1		
0017	17	8M			62.6 -	4.3 +	845 -	6	+1		
0018	18	5H			65.9	3.3 +	915	6	0		
0019	19	5H			62.0 -	4.7 +2	855	6	-1		
0020	20	8M			61.6 -	4.5 +2	850	5	+1		
0021	21	4H			62.5 -	4.3 +	910	6	+1		
0022	22	3H			64.6	2.8	930	4	+1		
0023	23	5H			64.5	5.5 +2	875	5	-1		
0024	24	4M			61.6 -	3.5 +	760 -2	6	-1		
0025	25	8L			61.7 -	7.0 +2	710 -2	7	0		
0026	26	8L			61.7 -	6.4 +2	770 -2	7	+1		
0027	27	8L			61.7 -	6.5 +2	675 -2	9	-1		
0028	28	8L			61.6 -	7.8 +2	785 -2	6	+1		
0029	29	6M			64.4	6.8 +2	815 -	6	0		
0030	30	6M			63.0	4.2	790 +2	4	+1		
0031	31										
0032	32	8M			63.6	5.8 +2	815 -	4	+1		
0033	33	6M	8.74	5	60.6 -2	4.0 +	835 -	5	+1	201	U
0034	34	7M	8.50 -2	6 -2	58.4	6.0	790 +2	6	+1	237	U
0035	35	3M	9.25	6 -2	54.3	2.4	690 +2	8	+1	225	
0036	36	4H	8.38	5	62.6 -	4.2 +	890	6	+1	184	Q
0037	37	8M	8.38	6	61.3 -	6.9 +2	815 -	5	+1	195	U
0038	38	8M	8.64	6	61.5 -	7.5 +2	720 -2	8	-1	161	
0039	39	2H	8.05	4 -	64.3	2.1	860	6	0	146	U
0040	40										

* = standard mean nursery flour protein = 9.6 mill used = Quad

SAMPLE#	BREEDER#	MTYPE	CODI	TGS	BABS	MTIME	LVOL	BCRGR	PROQ	RVA	COLOR*
0041	41										
0042	42	1H	7.70	5							
0043	43										
0044	44	4H	8.22 -2	5 -2							
0045	45	3M	8.96 -	7 -						219	
0046	46	3M	9.44	8							
0047	47	2M	8.88 -	7 -						212	
0048	48	3L	9.39	9						179	
0049	49	4L	8.91 -	7 -						193	
0050	50	7M	9.05 -	8						174	
0051	51	3L	8.68 -2	7 -						147	
0052	52	2M	9.07 -	8						173	
0053	53	2M	8.24 -2	6 -2						106	U
0054	54	5M	8.99 -	6 -2						222	
0055	55	2M	8.94 -	7 -						232	
0056	56	4L	9.16	7 -						190	

* = standard		mean nursery flour protein = 9.6	mill used = Quad	
HWW		8.40	6	65.6
HWW		8.43	5	63.1
HWW		0.220	0.8	2.09
				1.8
				4.2
				2.23
				61.2
SWW		9.34	9	
SWW		8.95	7	56.4
SWW		0.315	1.0	2.90
				4.2
				2.55
				740
				70.7
HWW		8.40	6	65.6
HRW		7.70	5	62.8
HRW				1.58
				1.8
				4.8
				1.56
				890
				843
				73.9
SWW		9.34	9	
SRW		8.22	5	61.0
SRW				2.83
				3.6
				0.78
				862
				102.5
SWW		9.34	9	
CLUB		9.44	8	
CLUB				

COMMENTS: Quality parameters of HRW and HWW selections in this nursery were graded by comparison to the standard mean of Coulee. Quality parameters of SWW, SRW and CLUB selections were graded by comparison to the standard mean of Stephens. HRW lines with less than 10.5% wheat protein were excluded from further tests. Those classified as SRW (less than about 50 wheat hardness value) were also excluded from further testing. Some selections had poor test weight. Cookies were baked on all SSW, HWW and CLUB lines. Bread was baked on most HRW and HWW lines, unless their mixogram type showed poor mix time (too short) and/or weak mixing properties. RVA viscosity was run on all SSW and HWW lines. RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93°C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable.

Flour color was scored only on those SSW and HWW selections which had a minimum RVA viscosity of 150 and a minimum NIR wheat hardness (UWHRD) value of 40. Breeder #38 had insufficient flour for the color test. *Color represents an extremely important quality criterion in Asian types of noodles. A preliminary alkaline flour color test was initiated. An alkaline Pekar slick was used to subjectively measure flour color. The Pekar slick was prepared by pressing flour to a smooth surface, immersing in a 1.0% alkaline solution consisting of 60% K₂CO₃ and 40% Na₂CO₃ for 2 minutes. The sample rested at a room temperature of (77°F) for 4 hours before visual observation and scoring. Flours were scored by the following; S = satisfactory, Q = questionable, and U = unsatisfactory. Desirable flour color ranges from bright white through creamy yellow to bright yellow. Any dullness, brown, or greenish casts would be unacceptable. Alkaline flour color (COLOR) is scored only on SSW, HWW, SWS and HWS wheats which have a minimum RVA viscosity of 150 and a minimum NIR wheat hardness (UWHRD) value of 40.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
*0001	STEPHENS	1	SWW	58.3	22	10.6	68.4	38.3	0.32	87.8	8.9	55.3
0002	D8902901	2	HRW	60.1	54	10.7	67.9 +	33.2	0.29	88.2	9.6	57.8
0003	D8902902	3	SWW	59.0	24	9.7	67.3	40.1	0.35 -	84.5 -	8.3	53.4
0004	D8903001	4	HRW	61.0 +	71	13.8 +	63.9 -2	29.3	0.35 -2	80.8 -2	12.8 +2	64.7 +2
0005	D8903101	5	HRW	59.0	64	12.3	65.3	29.0	0.33 -2	83.3 -	10.8	63.4 +
0006	D8903102	6	HRW	59.6	64	13.2 +	63.2 -2	28.5	0.34 -2	80.6 -2	12.0 +	62.5 +
0007	D8903103	7	HRW	59.5	65	13.4 +	62.1 -2	28.7	0.33 -2	80.0 -2	12.5 +	62.0 +
0008	D8903104	8	HRW	59.8	61	12.6 +	62.1 -2	28.4	0.33 -2	80.0 -2	11.8 +	62.0 +
0009	D8903105	9	HRW	59.9	70	13.5 +	62.4 -2	27.5	0.31 -	81.4 -2	12.4 +	62.5 +
0010	D8903106	10	HRW	57.6	67	14.1 +2	60.3 -2	29.7	0.31 -	79.2 -2	12.7 +2	58.5
0011	D8903108	11	HRW	58.4	65	12.8 +	66.2	28.7	0.34 -2	83.8 -	11.8 +	61.5 +
0012	D8903109	12	HRW	60.1	59	12.4	64.7 -	27.6	0.32 -	83.2 -	11.1	59.4
0013	D8903111	13	HRW	60.0	65	11.4	67.2	31.8	0.28	87.9	10.3	58.7
0014	D8903112	14	HRW	59.7	64	13.4 +	62.5 -2	29.9	0.32 -	80.9 -2	12.5 +	58.4
0015	D8903113	15	HRW	60.7 +	66	13.3 +	64.5 -	28.2	0.32 -	83.0 -	12.7 +2	58.4
0016	D8903201	16	HRW		54	10.5						
0017	D8903202	17	HRW	61.5 +	65	12.8 +						
0018	D8903203	18	HRW	61.6 +	59	12.4	63.7 -2	28.1	0.31 -	82.7 -	11.0	58.4
0019	D8903204	19	HRW	60.3 +	63	12.6 +	61.8 -2	27.6	0.34 -2	79.2 -2	10.6	59.3
0020	D8903205	20	HRW	59.1	70	14.4 +2	65.3	28.8	0.34 -2	82.8 -	13.3 +2	63.3 +
*0021	BATUM	21	HRW	58.6	60	10.9	66.2	32.9	0.29	86.4	9.9	58.8
0022	D8903206	22	HRW	59.9	59	14.4 +2	65.8	28.8	0.35 -2	82.8 -	13.2 +2	63.7 +
0023	D8903208	23	HRW	62.4 +2	72	14.2 +2	64.3 -	27.8	0.32 -	82.8 -	12.7 +2	62.5 +
0024	D8903209	24	HRW	62.4 +2	62	12.7 +	63.6 -2	29.1	0.34 -2	81.1 -2	11.7 +	61.4
0025	D8903210	25	HRW	60.2	64	12.9 +	64.8 -	29.4	0.30	84.4	11.8 +	61.4
0026	D8903211	26	HRW		52	10.6						
0027	D8903212	27	SRW		48	11.4						
0028	D8903213	28	HRW	59.7	55	13.1 +	65.5	30.2	0.28	86.2	11.9 +	60.3
0029	D8903214	29	HRW	61.7 +	61	13.4 +	63.3 -2	27.9	0.31 -	82.3 -	11.7 +	59.9
0030	D8903215	30	HRW	62.1 +2	67	13.4 +	63.5 -2	27.8	0.34 -2	80.9 -2	12.0 +	62.2 +
0031	D8903216	31	HRW	62.2 +2	65	12.8 +	62.4 -2	25.5	0.33 -2	80.3 -2	11.4 +	58.4
0032	D8903217	32	SRW		48	11.4						
0033	D8903218	33	HRW		54	10.6						
0034	D8903219	34	HRW	61.9 +	60	12.8 +	64.0 -	28.5	0.33 -2	82.0 -2	11.4 +	61.4
0035	D8903220	35	HRW	62.2 +2	71	13.4 +	63.0 -2	27.4	0.34 -2	80.4 -2	12.1 +	62.7 +
0036	D8903221	36	HRW	62.1 +2	59	11.6	64.5 -	29.4	0.31 -	83.6 -	10.5	58.5
0037	D8903223	37	HRW	60.0	65	12.0	64.9 -	30.9	0.31 -	84.0 -	11.0	59.5
0038	D8903224	38	HRW	61.1 +	78	13.0 +	64.2 -	29.1	0.30	83.8 -	12.8 +2	63.3 +
0039	D8903225	39	HRW		58	10.7						
0040	WA007679	40	HRW	60.5 +	73	11.1	65.1	32.6	0.28	85.8	10.7	61.2

* = standard mean nursery flour protein = 11.5 mill used = Quad

SAMPLE#	BREEDER#	MTYPE	COOI	TGS	BABS	MTIME	LVOL	BCRGR	PROQ	RVA	COLOR
*0001	1	2M	9.46	8	60.0	2.0	800 -	6	+1	173	
0002	2	2M	8.50	6 +2						179	S
0003	3	3M	9.19 -	8						169	
0004	4	5H			67.4 +2	5.5 +2	955 +	3	0		
0005	5	4M			65.6 +2	2.8	850	4	0		
0006	6	2H			64.7 +	2.3	825 -	6	-1		
0007	7	2H			64.2 +	1.6	815 -	6	-1		
0008	8	3M			65.2 +2	2.1	870	5	-1		
0009	9	2M			66.7 +2	4.7 +	875	5	-1		
0010	10	3M			60.7	2.1	830 -	7	-1		
0011	11	4H			64.7 +	3.5	935 +	4	+1		
0012	12	4M			64.6 +	2.9	880	4	0		
0013	13	4M			61.9	2.5	850	6	+1		
0014	14	1H			60.6	1.8	790 -2	6	-1		
0015	15	2H			62.6	1.8	960 +2	7	0		
0016	16										
0017	17										
0018	18	4H			63.6 +	3.7 +	815 -	5	-1		
0019	19	5M			63.5 +	5.8 +2	885	4	+1		
0020	20	3H			65.5 +2	3.2	1010 +2	2	0		
*0021	21	3M			60.5	2.2	875	5	+1		
0022	22	3H			65.9 +2	3.1	1050 +2	3	+1		
0023	23	3H			66.7 +2	3.0	970 +2	4	0		
0024	24	3H			64.6 +	3.1	970 +2	4	+1		
0025	25	3H			63.6 +	3.5	925 +	4	0		
0026	26										
0027	27										
0028	28	7M			62.5	4.2 +	920 +	5	0		
0029	29	8M			64.1 +	4.6 +	945 +	4	+1		
0030	30	3H			65.4 +2	3.0	895	4	0		
0031	31	3H			62.6	3.0	835	5	-1		
0032	32										
0033	33										
0034	34	4H			64.6 +	3.6 +	830 -	5	-1		
0035	35	3H			64.9 +	3.0	855	5	-1		
0036	36	8M			61.2	4.3 +	875	6	+1		
0037	37	3H			62.7	3.5	890	5	+1		
0038	38	5H			66.0 +2	5.0 +2	960 +2	3	0		
0039	39										
0040	40	4H	8.15	6 +2	63.4 +	3.9 +	790 -2	5	-1	150	Q

* = standard mean nursery flour protein = 11.5 mill used = Quad

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0041	D8903227	41	HRW		55	10.9						
0042	D8903228	42	SRW		48	10.7						
0043	D8903232	43	HRW	58.9	61	13.8 +	65.4	29.7	0.37 -2	81.4 -2	12.8 +2	63.4 +
0044	D8903233	44	SRW		48	11.6						
0045	D8903234	45	HRW	61.8 +	62	12.8 +	63.5 -2	27.0	0.33 -2	81.5 -2	11.4 +	59.5
0046	D8903237	46	HRW		68	14.5 +2	66.2	29.8	0.36 -2	82.7 -	13.6 +2	64.2 +
0047	D8903245	47	HRW		65	12.0						
0048	D8903247	48	HRW		59	10.6						
0049	D8903402	49	HRW	59.4	62	11.6	64.6 -	30.1	0.32 -	83.1 -	10.5	57.9
0050	D8903405	50	HRW		66	14.1 +2						
0051	D8903602	51	HRW	59.0	63	12.1	64.1 -	28.8	0.32 -	82.6 -	11.4 +	60.3
0052	V087419	52	SRW		19	11.0						
0053	V8861001	53	HRW	59.6	56	12.5 +	64.3 -	30.1	0.29	84.4	10.9	60.7
0054	V8901903	54	SRW	58.2	22	11.5	65.9 -2	36.9	0.29 +	86.6	9.7	55.0

* = standard mean nursery flour protein = 11.5 mill used = Quad

Standard Mean												
Nursery Mean			SRW	58.3	22	10.6	68.4	38.3	0.32	87.8	8.9	55.3
Nursery Standard deviation			SRW	58.5	23	10.6	67.2	38.4	0.32	86.3	9.0	54.6
			SRW	0.44	1.2	0.90	1.25	1.60	0.030	1.67	0.70	1.02
Standard Mean			HRW	58.6	60	10.9	66.2	32.9	0.29	86.4	9.9	58.8
Nursery Mean			HRW	60.1	61	11.4	65.8	32.0	0.29	86.1	10.4	59.9
Nursery Standard deviation			HRW	0.45	10.4	0.95	1.89	1.64	0.006	1.92	0.70	1.84
Standard Mean			HRW	58.6	60	10.9	66.2	32.9	0.29	86.4	9.9	58.8
Nursery Mean			HRW	60.4	63	12.6	62.6	29.8	0.32	82.4	11.8	61.0
Nursery Standard deviation			HRW	1.30	5.3	1.15	8.81	5.35	0.021	1.99	0.93	2.05
Standard Mean			SRW	58.3	22	10.6	68.4	38.3	0.32	87.8	8.9	55.3
Nursery Mean			SRW		42	11.2						
Nursery Standard deviation			SRW		13.0	0.36						

SAMPLE#	BREEDER#	MTYPE	CODI	TGS	BABS	MTIME	LVOL	BCRGR	PROQ	RVA	COLOR*
0041	41										
0042	42										
0043	43	2H			64.6 +	2.9	1025 +2	4	+1		
0044	44										
0045	45	3H			62.7	3.4	835	5	-1		
0046	46										
0047	47	2H			64.9 +	3.0	1005 +2	2	0		
0048	48										
0049	49	8M			60.1	5.2 +2	815 -	6	0		
0050	50										
0051	51										
0052	52	3H			62.5	3.3	820 -	5	-1		
0053	53										
0054	54	7M	8.35	6 +2	64.4 +	5.1 +2	730 -2	6	-1	174	Q
		2M	8.79 -2	7	57.2	2.2	725 +2	8	-1	142	

* = standard mean nursery flour protein = 11.5 mill used = Quad

SWW	9.46	8								173	
SWW	9.15	8			57.2	2.2	725	8		161	
SWW	0.337	0.6								16.9	
HRW											
HRW	8.33	6			60.5	2.2	875	5		168	
HRW	0.176	0.0			62.6	3.7	773	6		15.5	
					2.31	1.56	37.9	0.6			
HRW											
HRW					60.5	2.2	875	5			
HRW					63.9	3.3	895	5			
HRW					1.91	1.07	69.5	1.2			
SWW	9.46	8								173	

COMMENTS: Quality parameters of SWW selections were graded by comparison to the standard mean of Stephens. Quality parameters of HRW and HWW selections were graded by comparison to the standard mean of Batum. HRW lines with less than 11.5% wheat protein were excluded from further tests. Those classified as SRW (less than 50 wheat hardness value) were also excluded from further testing. Breeder numbers - 17, 47 and 50 were dropped from quality testing because of one or more of the following reasons: smut, poor quality from the previous year or not advanced due to low yield. Cookies were baked on all SWW and HWW lines. Bred was baked on all HRW and HWW lines except those excluded from further testing as stated above. RVA viscosity was run on all SWW and HWW lines. *RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable.

Flour color was scored only on those SWW and HWW lines which had a minimum RVA viscosity of 150 and a minimum wheat hardness (UWHRD) value of 40. *Color represents an extremely important quality criterion in Asian types of noodles. A preliminary alkaline flour color test was initiated. An alkaline Pekar slick was used to subjectively measure flour color. The Pekar slick was prepared by pressing flour to a smooth surface, immersing in a 1.0% alkaline solution consisting of 60% K₂CO₃ and 40% Na₂CO₃ for 2 minutes. The sample rested at a room temperature of (77°F) for 4 hours before visual observation and scoring. Flours were scored by the following: S = satisfactory, Q = questionable, and U = unsatisfactory. Desirable flour color ranges from bright white through creamy yellow to bright yellow. Any dullness, brown, or greenish casts would be unacceptable. Alkaline flour color (COLOR) is scored only on SWW, HWW, SWS and HWS wheats which have a minimum RVA viscosity of 150 and a minimum NIR wheat hardness (UWHRD) value of 40.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0001	NUGAINES	1	SWW		33	10.7						
0002	STEPHENS	2	SWW	56.8 -	37	12.1	66.3	33.7	0.37	82.0 -	11.1	55.2
0003	MALCOLM	3	SWW		35	12.0						
*0004	HILL-81	4	SWW	59.0	35	11.4	67.6	35.6	0.36	84.3	11.5	55.3
*0005	MADSEN	5	SWW	58.7	38	11.6	67.2	34.4	0.35	84.4	10.7	55.2
0006	DAWS	6	SWW		31	11.0						
0007	LEWJAIN	7	SWW	57.9	31	11.9	65.2 -2	38.3	0.36	81.2 -	10.5	54.7
0008	KHOR	8	SWW		29	11.6						
0009	ELTAN	9	SWW		30	12.0						
0010	WA007662	10	SWW	59.2	37	10.9	68.1	35.4	0.35	85.5	10.2	52.2 +
0011	SYRINGA	11	SWW		44	11.4						
0012	MORO	12	CLUB	56.8 -	28	12.1	67.2 -	39.9	0.43 -2	79.3 -2	11.1	53.1 -
*0013	ELGIN	13	CLUB	60.1	40	10.9	69.6	37.5	0.38	85.5	10.5	51.4
0014	CREW	14	CLUB		37	10.6						
*0015	TRES	15	CLUB	57.5	38	11.1	68.0	38.7	0.40	82.2	10.2	49.2
0016	HYAK	16	CLUB	57.2	37	11.1	68.3	38.9	0.34 +2	86.4 +	9.9	55.2 -
0017	RELY	17	CLUB		24	10.7						
0018	WA007621	18	SWW	57.5	37	11.7	66.1 -	35.0	0.40 -2	79.8 -2	10.9	53.1
0019	OR000855	19	SWW	60.9 +	39	10.1	68.8 +	36.4	0.36	85.8	9.8	53.1
0020	WA007729	20	SWW	57.3	32	10.2	70.5 +2	38.6	0.39 -	86.1	9.3 +	50.2 +
0021	WA007689	21	SWW	57.3	39	11.3	68.2	36.9	0.36	85.0	10.2	54.4
0022	WA007686	22	SWW	58.5	42	12.1	68.2	34.9	0.34	86.3	10.5	54.0
0023	WA007687	23	SWW	57.4	30	11.5	68.2	34.9	0.37	84.4	10.4	54.0
0024	WA007663	24	SWW	54.9 -2	33	13.0	65.5 -	36.9	0.36	81.6 -	10.5	54.0
0025	WA007664	25	SWW	58.9	27	11.5	64.7 -2	40.0	0.35	81.2 -	10.6	55.0
0026	WA007730	26	SWW	58.6	37	11.2	65.5 -	36.1	0.36	81.6 -	10.5	54.3
0027	WA691213	27	SWW	59.0	24	11.8	63.7 -2	37.5	0.38 -	78.0 -2	10.4	55.0
0028	VB089024	28	SWW	58.4	31	10.3	68.1	36.6	0.35	85.5	9.8	49.8 +2
0029	VC089042	29	SWW	55.8 -	24	10.4	66.8	39.5	0.42 -2	79.4 -2	9.4 +	51.5 +
0030	VD088175	30	SWW	57.1 -	25	11.9	66.1 -	37.4	0.37	81.7 -	10.0	53.3
0031	VH086048	31	SWW	59.3	26	11.0	69.8 +2	37.6	0.38 -	85.8	10.0	51.9 +
0032	VH087384	32	SWW	55.4 -2	35	12.7	62.1 -2	35.5	0.37	76.6 -2	10.9	53.8
0033	VH087512	33	SWW	56.9 -	26	12.0	61.2 -2	36.9	0.31 +2	79.3 -2	10.7	53.8
0034	VH088448	34	SWW	60.0	30	11.1	63.7 -2	38.3	0.35	79.9 -2	9.9	54.0
0035	VH089541	35	SWW	59.4	41	11.9	68.1	34.6	0.38 -	83.6	10.4	55.4
0036	VH089544	36	SWW	58.7	30	12.0	65.0 -2	38.2	0.41 -2	77.8 -2	10.1	55.1
0037	VH089608	37	SWW	57.6	38	11.0	66.1 -	35.8	0.34	83.6	10.0	54.9
0038	VH089689	38	SWW	53.7 -2	40	12.6	61.2 -2	29.8	0.36	76.1 -2	11.1	55.8
0039	VH088568	39	SWW	59.2	30	12.0	64.2 -2	36.6	0.34	81.2 -	10.5	55.8
0040	VH089358	40	SWW	58.5	26	12.1	63.4 -2	42.5	0.38 -	77.6 -2	11.0	55.8

* = standard mean nursery flour protein = 10.5 mill used = Quad

SAMPLE#	BREEDER#	MTYPE	CODI	TGS	BABS	MTIME	LVOL	BCRGR	PROQ	RVA*	COLOR*
0001	1										
0002	2	2M	8.99	7						190	
0003	3										
*0004	4	2M	9.15	8						178	
*0005	5	2M	9.06	8						174	
0006	6										
0007	7	2M	8.88	7						184	
0008	8										
0009	9										
0010	10	2M	8.94	8						177	
0011	11										
0012	12	2M	9.02 -	7						211	
*0013	13	1M	9.48	9						222	
0014	14										
*0015	15	1M	9.12	7						209	
0016	16	5M	8.91 -	7						219	
0017	17										
0018	18	1M	9.10	7						184	
0019	19	2M	9.10	8						222	
0020	20	1M	9.49 +	9						206	
0021	21	4M	8.75 -	7						207	S
0022	22	4M	8.69 -	6 -						187	q
0023	23	2M	8.52 -2	6 -						171	
0024	24	3M	9.19	7						199	
0025	25	4M	8.91	6 -						179	
0026	26	3M	8.93	7						194	
0027	27	2M	8.93	6 -						174	
0028	28	1M	9.11	5 -2						241	
0029	29	4M	9.35	9						198	
0030	30	2M	9.06	8						209	
0031	31	2M	8.94	7						206	
0032	32	3M	8.62 -	6 -						249	
0033	33	4M	8.86	6 -						258	
0034	34	3M	9.06	7						183	
0035	35	4M	8.65 -	6 -	59.6	2.5	810	6	0	188	q
0036	36	2M	9.06	6 -						168	
0037	37	2M	9.09	7						188	
0038	38	1M	8.59 -	6 -						183	q
0039	39	2M	8.96	8						204	
0040	40	3M	8.65 -	5 -2						260	

* = standard mean nursery flour protein = 10.5 mill used = Quad

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0041	VH089218	41	HWW	59.4	70	10.8	63.4 -2	25.3	0.36	79.8 -2	9.9	54.5
0042	VB090012	42	SHW	60.3	33	10.9	69.8 +2	38.9	0.31 +2	90.3 +2	9.3 +	52.5 +
0043	VD090181	43	SHW	58.7	29	12.2	66.8	37.1	0.35	83.9	10.7	53.4
0044	VG090219	44	SHW	54.9 -2	37	11.3	67.3	38.6	0.35	84.5	10.2	53.3
0045	VH090032	45	HWW	55.9 -	57	13.1 -	60.9 -2	29.1	0.38 -	76.1 -2	11.5	58.3 -
0046	VH090036	46	SHW	58.5	34	12.4	66.7	36.9	0.35	83.8	10.4	56.9
0047	VH090344	47	HWW	57.4	51	12.5	64.6 -2	32.3	0.34	82.1 -	10.4	55.9
0048	VH090397	48	SHW	58.1	28	10.7	66.7	38.4	0.32 +	85.7	9.9	54.9
0049	VH090437	49	SHW	59.6	30	11.1	68.1	38.6	0.32 +	87.5 +	10.2	54.9
0050	VH090514	50	SHW	57.0 -	34	12.8	62.7 -2	34.5	0.34	79.3 -2	11.2	54.7
0051	VH090551	51	SHW	56.7 -	39	12.9	64.6 -2	34.6	0.33 +	82.4	11.3	54.8
0052	VH090604	52	HWW	58.2	57	12.3	62.6 -2	28.4	0.33 +	80.5 -	11.2	55.7
0053	VH090656	53	SHW	59.4	33	11.3	63.8 -2	36.2	0.28 +2	84.5	9.9	52.8
0054	VJ090105	54	SHW	57.0 -	34	10.7	69.2 +	38.7	0.36	86.3	10.1	52.3 +
0055	VJ090677	55	SHW	58.2	20	11.6	64.2 -2	40.6	0.33 +	81.8 -	10.4	53.6
0056	VJ090683	56	SHW	56.5 -	31	12.1	66.9	36.2	0.35	84.0	10.8	53.7
0057	VM090687	57	SHW	58.4	28	12.3	65.2 -2	36.4	0.37	80.6 -	10.6	57.2
0058	WA007717	58	SHW	56.5 -	31	13.0	63.9 -2	34.5	0.36	79.6 -2	11.2	54.8
0059	ORFW0301	59	SHW	55.5 -	34	14.0 -	65.0 -2	34.3	0.37	80.3 -	11.8	55.6
0060	OR832784	60	SHW	56.5 -	32	13.4 -	61.8 -2	36.6	0.37	76.2 -2	11.6	56.2
0061	ORFW3115	61	SHW	55.5 -	38	13.1 -	-- milling error - flour lost					
0062	ORF75336	62	SHW	58.3	36	12.4	-- milling error - flour lost					
0063	OR833765	63	SHW	56.5 -	32	13.5 -	63.4 -2	32.7	0.37	78.3 -2	11.1	56.7
0064	OR840815	64	SHW	58.9	31	12.4	66.5	35.8	0.36	82.9	11.0	55.7
0065	ID081277	65	SHW	55.7 -	30	12.4	63.0 -2	34.3	0.37	77.8 -2	10.9	54.6
0066	ORCW8635	66	HWW	57.4	51	11.6	63.2 -2	25.7	0.35	80.1 -2	10.1	53.3
0067	OR830801	67	SHW	58.5	30	11.2	65.7 -	36.2	0.33 +	83.8	10.0	53.2
0068	WA007697	68	SHW	57.9	34	12.0	66.9	37.4	0.36	83.4	10.9	54.9
0069	WA007622	69	SHW	57.8	35	9.9 +	69.3 +	36.6	0.34	87.7 +	9.2 +	50.2 +
0070	WA007690	70	SHW	58.3	27	12.7	65.4 -	34.6	0.34	82.7	10.6	52.7
0071	VB091005	71	SHW	58.7	37	11.0	65.2 -2	34.4	0.33 +	83.1	9.6 +	52.8
0072	VB091012	72	HWW	61.8 +	69	11.8	63.6 -2	24.8	0.32 +	82.1 -	10.0	54.2
0073	VB091023	73	SHW	56.1 -	41	12.9	64.0 -2	35.2	0.38 -	78.4 -2	11.3	54.3
0074	VB091025	74	SHW	60.6 +	46	9.7 +	69.2 +	36.8	0.33 +	88.2 +	9.2 +	52.8
0075	VJ091139	75	SHW	56.9 -	39	12.3	65.9 -	33.3	0.38 -	80.8 -	10.9	54.7
0076	VJ091143	76	SHW	59.5	44	11.7	66.1 -	34.3	0.35	83.0	10.6	53.8
0077	VH091753	77	HWW	58.6	73	12.4	64.3 -2	27.5	0.35	81.3 -	11.2	57.7
0078	VJ091144	78	SHW	59.0	38	12.5	63.6 -2	34.8	0.32 +	81.7 -	11.2	54.9
0079	VH091208	79	SHW	56.9 -	40	12.0	63.5 -2	34.5	0.40 -2	76.5 -2	10.5	54.7
0080	VH091210	80	SHW	60.1	29	10.6	62.8 -2	36.8	0.34	79.4 -2	9.5 +	52.8

* = standard mean nursery flour protein = 10.5 mill used = Quad

SAMPLE#	BREEDER#	MTYPE	CODI	TGS	BABS	MTIME	LVOL	BCRGR	PROQ	RVA*	COLOR*
0041	41	4M	8.20 -2	3 -2						216	U
0042	42	3M	9.10	8						219	
0043	43	1M	9.48 +	8						205	
0044	44	3M	8.94	7						208	
0045	45	3M	8.80 -	5 -2						198	U
0046	46	2M	9.29	7						175	
0047	47	3M	8.68 -	6 -						235	Q
0048	48	4M	9.12	7						191	
0049	49	1M	9.48 +	9						177	
0050	50	2M	9.01	6 -						222	
0051	51	3M	8.93	7						198	S
0052	52	1H	8.56 -2	5 -2						171	Q
0053	53	3M	8.80 -	6 -						253	
0054	54	1M	9.57 +	9						204	
0055	55	3M	9.09	7						212	
0056	56	2M	9.26	7						175	
0057	57	4M	9.36	8						187	
0058	58	1M	9.10	7						179	
0059	59	1M	9.02	7						196	
0060	60	3M	8.90	6 -	57.9	3.3	830	5	-1	231	
0061	61										
0062	62										
0063	63	4M	8.44 -2	6 -						215	
0064	64	1M	9.29	7						196	
0065	65	2M	8.89	7						247	
0066	66	4M	8.53 -2	6 -						211	U
0067	67	3M	9.12	8						204	
0068	68	2M	9.25	8						222	
0069	69	2L	8.94	8						216	
0070	70	1M	9.21	8						180	
0071	71	3L	8.90	7						206	
0072	72	4M	8.25 -2	4 -2	56.9	3.0	705	7	-1	210	U
0073	73	4M	8.57 -2	6 -						217	Q
0074	74	2L	9.07	8						218	Q
0075	75	2M	9.06	7						172	Q
0076	76	1M	8.93	7						208	U
0077	77	4M	8.21 -2	4 -2	60.9	2.5	855	4	0	186	
0078	78	1M	9.12	7						198	
0079	79	5M	8.74 -	5 -2	59.9	3.5	905	6	+1	216	
0080	80	3M	9.06	7						243	

* = standard

mean nursery flour protein = 10.5

mill used = Quad

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0081	VH091211	81	SWW	58.6	39	10.2	64.6 -2	36.2	0.35	81.1 -	9.4 +	52.7
0082	VH091216	82	SWW	58.0	32	11.8	62.6 -2	35.8	0.37	77.3 -2	10.4	53.2
0083	VH091232	83	HHW	58.3	71	12.7	65.9 -	31.8	0.38 -	81.4 -	11.4	58.4 -
0084	VH091279	84	SWW	58.5	32	12.0	64.3 -2	37.7	0.38 -	78.8 -2	10.6	54.8
0085	VH091283	85	SWW	59.6	42	10.2	64.0 -2	35.6	0.34	81.0 -	9.8	53.2
0086	VH091289	86	SWW	59.1	33	11.4	69.4 +	40.0	0.39 -	84.6	10.5	53.7
0087	VH091290	87	SWW	55.6 -	28	12.3	65.0 -2	37.0	0.36	81.0 -	10.3	52.3 +
0088	VH091299	88	SWW	55.9 -	39	12.5	65.5 -	35.3	0.40 -2	79.0 -2	10.9	54.4
0089	VH091308	89	SWW	57.1 -	39	12.5	64.5 -2	35.2	0.39 -	78.4 -2	11.0	53.4
0090	VH091355	90	SWW	56.8 -	43	11.8	64.8 -2	33.6	0.42 -2	76.9 -2	11.0	54.6
0091	VH091364	91	SWW	60.1	42	11.3	64.5 -2	29.7	0.37	79.7 -2	10.0	52.7
0092	VH091366	92	SWW	57.3	47	13.7 -	67.1	36.1	0.41 -2	80.4 -	11.5	54.6
0093	VH091369	93	SWW	59.0	42	12.0	63.3 -2	30.5	0.37	78.2 -2	10.6	53.2
0094	VH091390	94	SWW	57.6	42	13.4 -	65.9 -	36.1	0.43 -2	77.6 -2	11.5	53.7
0095	VH091411	95	SWW	59.6	30	10.7	65.1 -2	36.1	0.39 -	79.2 -2	9.6 +	50.7 +
0096	VH091421	96	SWW	57.8	32	11.3	67.1	38.4	0.40 -2	81.1 -	11.3	52.6
0097	VH091467	97	SWW	58.8	40	10.6	63.9 -2	36.1	0.39 -	77.6 -2	9.8	52.4 +
0098	VH091498	98	SWW	58.7	30	11.7	63.0 -2	37.4	0.40 -2	75.9 -2	10.6	52.4 +
0099	VH091505	99	HHW	59.8	69	12.7	66.8	30.1	0.36	83.3	11.4	57.4
0100	VH091528	100	SWW	58.8	44	12.2	65.6 -	32.8	0.35	82.4	10.8	53.5
0101	VH091548	101	HHW	59.3	64	11.9	65.2 -2	26.9	0.38 -	80.6 -	10.6	55.8
0102	VH091552	102	HHW	60.4	72	12.5	65.5 -	29.5	0.35	82.5	11.2	57.1
0103	VH091553	103	HHW	58.0	74	12.0	63.8 -2	25.3	0.37	79.7 -2	11.0	56.8
0104	VH091556	104	SWW	56.2 -	43	11.1	68.4	39.5	0.36	85.3	10.0	52.8
0105	VH091570	105	SWW	56.5 -	43	12.3	62.6 -2	35.0	0.32 +	80.4 -	10.7	53.6
0106	VH091602	106	SWW	57.1 -	38	11.5	64.3 -2	35.3	0.36	80.1 -2	10.1	52.6
0107	VH091650	107	SWW	60.1	36	11.6	64.9 -2	34.4	0.31 +2	84.0	10.7	53.6
0108	VH091651	108	HHW	60.5	68	12.0	63.3 -2	27.8	0.30 +2	82.8	10.7	57.3
0109	VH091666	109	SWW	58.0	40	12.5	65.5 -	35.7	0.35	82.2 -	11.2	54.3
0110	VH091682	110	SWW	57.7	48	11.9	66.9	38.2	0.38 -	82.1 -	10.9	54.6
0111	VH091685	111	HHW	57.7	66	12.1	62.9 -2	25.9	0.30 +2	82.4	10.4	55.1
0112	VH091692	112	SWW	58.8	28	11.9	65.9 -	35.7	0.33 +	84.0	10.4	54.4
0113	VH091698	113	SWW	57.0 -	39	11.5	63.8 -2	34.6	0.36	79.4 -2	10.4	51.3 +
0114	VH091699	114	SWW	57.5	38	11.6	63.8 -2	38.2	0.35	80.1 -2	10.4	52.4 +
0115	VH091705	115	SWW	57.7	25	12.0	63.9 -2	38.0	0.34	80.8 -	10.2	51.4 +
0116	VH091709	116	HHW	58.1	68	13.4 -	61.4 -2	24.3	0.31 +2	80.3 -	11.5	56.4
0117	VH091731	117	SWW	59.2	35	11.7	62.7 -2	35.7	0.34	79.3 -2	10.1	50.3 +
0118	VH091739	118	SWW	58.8	36	12.1	67.2	36.8	0.34	85.0	10.7	52.3 +
0119	VH091748	119	SWW	59.8	36	10.8	62.9 -2	37.5	0.33 +	80.2 -	9.7 +	51.6 +
0120	WA007695	120	SWW	58.5	43	11.0	67.1	36.9	0.38 -	82.4	9.9	51.3 +

* = standard mean nursery flour protein = 10.5 mill used = Quad

SAMPLE#	BREEDER#	MTYPE	CODI	TGS	BABS	MTIME	LVOL	BCRGR	PROQ	RVA*	COLOR*
0081	81	5M	8.79 -	6 -						244	S
0082	82	4M	8.71 -	6 -						245	
0083	83	4H	8.39 -2	6 -	61.1	4.1	835	4	-1	171	U
0084	84	4M	8.75 -	6 -						236	
0085	85	3M	9.00	7						246	Q
0086	86	2M	9.10	8						186	
0087	87	2M	9.44 +	8						211	
0088	88	4M	8.90	7						224	U
0089	89	3M	8.54 -2	5 -2						235	Q
0090	90	3M	8.79 -	6 -						187	U
0091	91	2L	8.52 -2	6 -						214	S
0092	92	2M	9.12	8						186	Q
0093	93	2M	8.60 -	6 -						202	Q
0094	94	3M	8.70 -	7						194	Q
0095	95	4M	8.94	7						232	
0096	96	2M	9.14	7						167	
0097	97	3M	8.98	7						261	S
0098	98	2M	8.68 -	6 -						245	
0099	99	2H	8.64 -	5 -2	58.6	2.0	795	5	-1	218	Q
0100	100	2M	8.86	7						182	U
0101	101	2M	8.35 -2	4 -2						175	Q
0102	102	3H	8.46 -2	3 -2	59.8	3.3	885	5	0	217	S
0103	103	2H	8.41 -2	5 -2	62.0	2.5	820	6	-1	194	
0104	104	5M	8.99	8						201	Q
0105	105	2M	8.85	7						220	S
0106	106	2M	8.75 -	7						180	
0107	107	2M	9.01	8						179	
0108	108	3M	8.48 -2	6 -						200	S
0109	109	2M	9.00	8						164	U
0110	110	1M	8.91	7						146	Q
0111	111	2M	8.49 -2	5 -2						193	U
0112	112	2M	9.04	8						182	
0113	113	2H	8.80 -	6 -						238	
0114	114	2M	9.01	7						199	
0115	115	2M	8.95	7						178	
0116	116	2M	8.32 -2	4 -2						164	U
0117	117	2M	8.89	6 -						244	
0118	118	1M	9.27	8						166	
0119	119	2M	8.73 -	7						238	
0120	120	4M	9.06	8						207	Q

* = standard

mean nursery flour protein = 10.5

mill used = Quad

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0121	CASHUP	121	SWW		25	10.7						
0122	BASIN	122	SWW		23	11.4						
0123	OVESON	123	SWW		24	11.4						
0124	WA007731	124	HWW		51	11.8						
0125	WA007732	125	SWW	57.6	40	13.0	64.6 -2	34.6	0.35	81.1 -	11.3	53.2
0126	FLORA	126	TRIT		47	13.4 -						
0127	KAYSON01	127	TRIT		92	13.4 -						
0128	KAYSON02	128	TRIT		85	12.4						
0129	WHITMAN	129	TRIT		54	12.1						
0130	SALMON	130	SWW		47	11.9						
0131	PB183058	131	SWW	58.8	47	12.7	65.1 -2	31.4	0.36	81.1 -	11.5	53.7
0132	PB185001	132	HWW	58.2	51	12.5	64.8 -2	30.9	0.38 -	80.2 -	11.5	53.2

* = standard mean nursery flour protein = 10.5 mill used = Quad

Standard Mean	SWW	37	58.8	11.5	67.4	35.0	0.36	84.3	11.1	55.2
Nursery Mean	SWW	35	57.9	11.7	65.5	36.1	0.36	81.6	10.5	53.7
Nursery Standard deviation	SWW	6.2	1.41	0.86	2.10	2.17	0.027	3.08	0.60	1.51
Standard Mean	CLUB	39	58.8	11.0	68.8	38.1	0.39	83.8	10.4	50.3
Nursery Mean	CLUB	34	57.9	11.1	68.3	38.8	0.39	83.3	10.4	52.2
Nursery Standard deviation	CLUB	6.4	1.49	0.54	1.00	0.98	0.038	3.25	0.51	2.55
Standard Mean	SWW	37	58.8	11.5	67.4	35.0	0.36	84.3	11.1	55.2
Nursery Mean	HWW	64	58.7	12.2	63.9	27.8	0.35	81.0	10.9	56.1
Nursery Standard deviation	HWW	8.6	1.45	0.61	1.58	2.57	0.028	1.73	0.57	1.66
Standard Mean	SWW	37	58.8	11.5	67.4	35.0	0.36	84.3	11.1	55.2
Nursery Mean	TRIT	70		12.8						
Nursery Standard deviation	TRIT	22.3		0.68						

SAMPLE#	BREEDER#	MTYPE	CODI	TGS	BABS	MTIME	LVOL	BCRGR	PROQ	RVA*	COLOR*
0121	121										
0122	122										
0123	123										
0124	124										
0125	125	2M	8.88	7						204	S
0126	126										
0127	127										
0128	128										
0129	129										
0130	130										
0131	131	2M	8.51 -2	7						147	Q
0132	132	1M	8.44 -2	6 -						223	Q

* = standard mean nursery flour protein = 10.5 mill used = Quad

SWW 9.10 8
 SWW 8.97 7
 SWW 0.237 0.9 59.1 3.1 848 6 0
 1.08 0.53 50.1 0.6 1.0

CLUB 9.30 8
 CLUB 9.13 8
 CLUB 0.247 1.0 215 215 6.2

SWW 9.10 8
 HWW 8.45 5
 HWW 0.168 1.0 59.9 2.9 816 5 -1
 1.87 0.74 62.3 1.2 0.5

SWW 9.10 8

TRIT

COMMENTS: Quality parameters of SWW and HWW selections were graded by comparison to the standard mean of Hill 81 and Madsen. Quality parameters of Club selections were graded by comparison to the standard mean of Elgin and Tres. Due to the large number of wheat check varieties included in this nursery, several were excluded from testing. These were Breeder #'s 1, 3, 6, 8, 9, 11, 14, 17, 121, 122, 123, 124 and 130. Also excluded were four Triticale lines, Breeder #'s 126, 127, 128 and 129. Five replications were received for this nursery from Walla Walla. Only replications 2 and 3 were composited for quality testing. Cookies were baked on all of the lines. Bread was baked only on those lines (SWW or HWW) which had the better or most promising mixogram characteristics (stronger mixing and bread-making properties). Bread baking data of SWW and HWW lines were not graded due to the lack of an appropriate bread type check variety. Flour samples of Breeder #'s 61 and 62 were inadvertently composited while milling and no valid milling data was obtained. Flour ash and protein content, mixogram and cookie data would also be invalid. RVA viscosity was run on all SWW and HWW lines. *RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable.

Flour color was scored only on those SWW and HWW lines which had a minimum RVA viscosity of 150 and a minimum wheat hardness (UWHRD) value of about 40. Breeder #'s 72, 77, 79, 103 and 113 had insufficient flour for the color test. *Color represents an extremely important quality criterion in Asian types of noodles. A preliminary alkaline flour color test was initiated. An alkaline Pekar slick was used to subjectively measure flour color. The Pekar slick was prepared by pressing flour to a smooth surface, immersing in a 1.0% alkaline solution consisting of 60% K₂CO₃ and 40% Na₂CO₃ for 2 minutes. The sample rested at a room temperature of (77°F) for 4 hours before visual observation and scoring. Flours were scored by the following; S = satisfactory, Q = questionable, and U = unsatisfactory. Desirable flour color ranges from bright white through creamy yellow to bright yellow. Any dullness, brown, or greenish casts would be unacceptable.

SAMPLE#	VARIETY	BREEDER#	CLASS	UWHRD	WPROT*
0001	ANDREWS	1	HRW	45	8.2
0002	BASIN	2	SWW	32	7.4
0003	FW301	3	SWW	27	7.3
0004	BUCHANAN	4	HRW	64	8.3
0005	CASHUP	5	SWW	24	8.8
0006	DAWS	6	SWW	37	7.5
0007	WA7662	7	SWW	31	9.0
0008	ELTAN	8	SWW	25	7.3
0009	MACVICAR	9	SWW	34	7.4
0010	FLORA (triticale)	10	TRIT	31	7.4
0011	HILL 81	11	SWW	40	9.6
0012	HYAK	12	CLUB	36	8.6
0013	KHOR	13	SWW	28	7.6
0014	LEWJAIN	14	SWW	33	7.0
0015	MADSEN	15	SWW	29	10.6
0016	MALCOLM	16	SWW	32	9.0
0017	GENE	17	SWW	26	8.1
0018	OR855	18	CLUB	41	8.5
0019	HOFF	19	SRW	34	11.3
0020	OVESON	20	HWW	74	10.8
0021	STEPHENS	21	SWW	25	8.0
0022	TRES	22	CLUB	26	7.3
0023	RELY	23	CLUB	29	7.4
0024	WANSER	24	HRW	66	12.1
0025	WHITMAN (triticale)	25	TRIT	41	7.3
0026	YAMHILL	26	SWW	29	10.0
0027	OMAR	27	CLUB	29	7.3
0028	87-636	28	CLUB	33	7.2
0029	85HR6537	29	CLUB	29	8.1
0030	85HR5350	30	CLUB	31	6.9
0031	91-19.CER/YMH//HYS	31	SWW	27	7.4
0032	HYAK-TRES MIX	32	CLUB	29	6.6
0033	HYAK-OR855 MIX	33	CLUB	30	6.5
0034	HYAK-OR855-TRES MIX	34	CLUB	28	6.4
0035	MORO	35	CLUB	27	7.0
0036	UTE	36	HRW	60	8.3

*As is moisture basis, NIR wheat protein (calibrated by Leco elemental analysis)

SAMPLE#	VARIETY	BREEDER#	CLASS	UWHRD	WPROT*
0001	ANDREWS	1	HRW	48	11.2
0002	BASIN	2	SWW	21	9.2
0003	FW301	3	SWW	31	9.2
0004	BUCHANAN	4	HRW	56	8.1
0005	CASHUP	5	SWW	28	9.5
0006	DAWS	6	SWW	30	8.4
0007	WA7662	7	SWW	38	9.3
0008	ELTAN	8	SWW	34	9.9
0009	MACVICAR	9	SWW	28	10.1
0010	FLORA (triticale)	10	TRIT	30	11.6
0011	HILL 81	11	SWW	32	10.7
0012	HYAK	12	CLUB	42	9.6
0013	KMOR	13	SWW	32	9.2
0014	LEWJAIN	14	SWW	31	10.1
0015	MADSEN	15	SWW	40	10.9
0016	MALCOLM	16	SWW	29	8.7
0017	GENE	17	SWW	35	9.7
0018	OR855	18	CLUB	30	8.2
0019	HOFF	19	SWW	30	8.9
0020	OVESON	20	HRW	68	9.9
0021	STEPHENS	21	SWW	29	8.0
0022	TRES	22	CLUB	30	7.5
0023	RELY	23	CLUB	28	7.6
0024	WANSER	24	HRW	55	10.3
0025	WHITMAN (triticale)	25	TRIT	59	9.3
0026	YAMHILL	26	SWW	34	8.7
0027	OMAR	27	CLUB	30	8.2
0028	87-636	28	CLUB	34	8.0
0029	85HR6537	29	CLUB	31	8.2
0030	85HR5350	30	CLUB	28	7.7
0031	91-19.CER/YMH//HYS	31	SWW	44	8.6
0032	HYAK-TRES MIX	32	CLUB	39	7.9
0033	HYAK-OR855 MIX	33	CLUB	44	8.8
0034	HYAK-OR855-TRES MIX	34	CLUB	38	10.0
0035	MORO	35	CLUB	35	10.8
0036	UTE	36	HRW	61	11.3

*As is moisture basis, NIR wheat protein (calibrated by Leco elemental analysis)

SAMPLE#	BREEDER#	MTYPE	CODI	TGS
0001	1	3L	9.02	7
0002	2	2L	8.44 -2	6 -
0003	3	4L	8.89	7
0004	4			
0005	5			
0006	6	5L	8.96	7
0007	7	1L	9.12	8
0008	8	1L	8.48 -2	6 -
0009	9	1L	8.88 -	7
0010	10	1L	8.97	8
0011	11	1L	9.60 +	9
0012	12	1L	9.03	7
0013	13	1L	8.60 -2	7
0014	14	1L	8.71 -	6 -
0015	15	1L	9.34	9
0016	16	1L	9.08	8
0017	17	1L	8.98	8
0018	18	3L	9.06	8
0019	19	1L	9.00	7
0020	20	1L	9.00	8
0021	21	3L	8.74 -	7
0022	22	3L	9.18	9
0023	23	4L	9.36	8
0024	24	3L	9.12	8
0025	25	1L	9.05	8
0026	26	2L	9.46 +	9
0027	27	1L	9.25	8
0028	28	5L	9.56 +	9
*0029	29	1L	9.20	8
*0030	30	1L	9.10	8

* = standard mean nursery flour protein = 6.3 mill used = Quad

CLUB	9.15	8
CLUB	9.02	8
CLUB	0.271	0.9
CLUB	9.15	8
SWW	9.56	9

COMMENTS: Quality parameters of CLUB selections in this nursery were graded by comparison to the standard mean of Omar and Hyak. Milling errors occurred on Breeder #'s 4 & 5. No valid milling data or flour was obtained since these two samples were inadvertently composited.

SAMPLE#	BREEDER#	MTYPE	CODI	TGS
0001	4	3L	8.93 -2	8
0002	6	1L	9.41	9
0003	8	2L	8.76 -2	8
0004	10	2L	8.73 -2	7 -
0005	12	3L	8.66 -2	7 -
0006	15	3L	8.95 -2	8
0007	16	1L	8.91 -2	7 -
0008	19	4L	8.95 -2	8
0009	20	4L	8.86 -2	8
0010	23	1L	9.23 -	9
0011	24	1L	9.18 -	9
0012	25	1L	9.40	9
0013	26	1L	8.95 -2	8
0014	27	3L	8.98 -2	8
0015	28	2L	8.80 -2	8
0016	29	2L	8.91 -2	8
0017	30	1L	8.74 -2	7 -
0018	31	1L	8.79 -2	8
0019	32	1L	8.88 -2	8
0020	33	1L	8.91 -2	7 -
0021	37	1L	9.01 -2	8
0022	38	2L	8.95 -2	8
*0023	41	2L	9.60	9
0024	42	3L	9.51	9
0025	43	3L	9.25 -	8
0026	44			
0027	45	1L	8.98 -2	8
0028	46	1L	9.19 -	8

* = standard mean nursery flour protein = 6.4 mill used = Quad

CLUB	9.60	9
CLUB	9.00	8
CLUB	0.232	0.6
CLUB	9.60	9
SWW	9.51	9
SWW		

COMMENTS: Selection OR855 was not processed in this nursery.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0001	861018-1H-0P-631P	2	CLUB	60.1	46	8.4	70.6 +	37.3	0.41 -	84.9	7.2	46.7
0002	861018-1H-0P-731P	3	CLUB	59.8	41	8.4	70.2	38.8	0.41 -	84.4	6.6	46.8
0003	860030-1H-0P-140P	14	CLUB	61.1	46	9.4	69.4	33.3	0.40 -	84.0	7.6	53.6 -2
0004	860030-1H-0P-155P	18	CLUB	61.4	50	10.0	69.8	33.7	0.36	87.1	7.8	49.6
0005	860030-1H-0P-178P	21	CLUB	61.0	47	8.6	68.9	37.0	0.35 +	86.6	7.0	48.8
0006	860030-1H-0P-206P	23	CLUB	59.7	31	8.2	69.0	38.9	0.33 +2	88.0 +	6.0	47.8
0007	860030-1H-0P-313P	35	CLUB	59.0	33	7.6	67.5 -	37.3	0.34 +	85.4	6.5	47.7
*0008	Paha	41	CLUB	60.5	43	8.8	69.3	36.2	0.38	85.2	6.8	47.1
0009	OR855	42	CLUB	62.0	51	8.4						
0010	Tres	43	CLUB	60.6	34	7.8	67.9 -	37.7	0.34 +	85.9	5.7	44.7
0011	Stephens	44	SWW	59.5	39	9.3	68.8	35.2	0.35 +	86.4	7.2	49.4
0012	Hyak	45	CLUB	60.0	41	8.3	66.8 -2	36.0	0.28 +2	88.3 +	5.4 +	51.1 -
0013	860018-2H-0P-1827P	46	CLUB	59.6	35	8.2	66.9 -2	38.2	0.31 +2	86.6	6.1	48.4
0014	860018-2H-0P-1831P	47	CLUB	59.7	39	10.1	65.4 -2	37.4	0.31 +2	84.6	7.4	50.2 -
0015	860018-2H-0P-1835P	48	CLUB	58.3 -	31	7.1 +	68.5	40.6	0.33 +2	87.3 +	5.5	47.9

* = standard
mean nursery flour protein = 6.6
mill used = Quad

mean nursery flour protein = 6.6

mill used = Quad

[illegible]

SAMPLE#	BREEDER#	MTYPE	CODI	TGS
0001	2	2L	8.99	8
0002	3	2L	9.30	8
0003	14	2M	9.27	8
0004	18	2L	9.00	8
0005	21	2L	9.15	8
0006	23	1L	9.40 +	9 +
0007	35	1L	9.33	8
*0008	41	2L	9.12	7
0009	42			
0010	43	3L	9.36	8
0011	44	2L	9.02	8
0012	45	3L	8.71 -	8
0013	46	2L	8.93	7
0014	47	2M	8.90	7
0015	48	1L	9.36	8

* = standard mean nursery flour protein = 6.6 mill used = Quad

CLUB 9.12 7
 CLUB 9.14 8
 CLUB 0.218 0.6
 CLUB 9.12 7
 SWW 9.02 8
 SWW

COMMENTS: Selection OR855 was not processed in this nursery.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0001	860030-1H-0P-427P	13	CLUB	59.8	36	7.4	65.4 -2	37.0	0.34	82.7 -	5.8	49.4
0002	860030-1H-0P-442P	15	CLUB	59.4	37	7.4	65.9 -2	36.1	0.36	82.1 -	6.2	48.7
0003	860030-1H-0P-572P	19	CLUB	59.6	39	7.9	66.8 -	36.0	0.36	83.2 -	6.8	48.2
0004	860030-1H-0P-664P	24	CLUB	59.2	41	8.0	66.5 -	35.0	0.35	83.5 -	6.7	48.7
0005	860031-1H-0P-880P	31	CLUB	60.1	37	8.3	68.1	36.6	0.37 -	84.3	7.1	47.7
0006	860031-1H-0P-979P	33	CLUB	60.1	31	8.2	68.5	37.0	0.37 -	84.8	7.0	47.6
0007	860031-1H-0P-1032P	34	CLUB	60.6	27	8.5	68.9	36.2	0.33	87.8	7.0	47.6
0008	860031-1H-0P-1049P	36	CLUB	60.6	36	7.8	67.7	37.0	0.34	85.7	6.5	47.7
0009	860031-1H-0P-1176P	40	CLUB	60.6	45	7.8	67.6	36.8	0.35	84.9	6.9	47.2
*0010	PAHA	41	CLUB	60.3	41	7.0	68.4	38.3	0.35	85.9	6.0	47.7
0011	STEPHENS	42	SWW	59.5	42	9.5 -	68.4	34.8	0.33	87.2	7.9 -	49.4
0012	OR855	43	CLUB		45	7.5						
0013	HYAK	44	CLUB	59.6	46	7.2	66.3 -	35.7	0.30 +2	86.4	6.0	51.6 -
0014	TRES	45	CLUB	59.9	31	8.0	67.3	37.8	0.35	84.5	6.1	47.7
0015	860018-2H-0P-1845P	48	CLUB	60.6	46	7.3	67.2 -	36.0	0.33	85.7	6.1	49.7

* = standard mean nursery flour protein = 6.6 mill used = Quad

Standard Mean CLUB 60.3 41 7.0 68.4 38.3 0.35 85.9 6.0 47.7

Nursery Mean CLUB 60.0 38 7.7 67.3 36.6 0.35 84.7 6.5 48.4

Nursery Standard deviation CLUB 0.49 6.0 0.45 1.06 0.88 0.019 1.60 0.46 1.22

Standard Mean CLUB 60.3 41 7.0 68.4 38.3 0.35 85.9 6.0 47.7

Nursery Mean SWW 59.5 42 9.5 68.4 34.8 0.33 87.2 7.9 49.4

Nursery Standard deviation SWW

SAMPLE#	BREEDER#	MTYPE	CODI	TGS
0001	13	2L	9.06	8
0002	15	1L	9.36 +	7
0003	19	2L	9.05	7
0004	24	2L	9.35 +	8
0005	31	2L	9.02	7
0006	33	2L	9.34	8
0007	34	2L	9.24	8
0008	36	2L	9.21	7
0009	40	2L	9.15	7
*0010	41	3L	9.09	8
0011	42	3L	9.32	8
0012	43			
0013	44	4L	9.02	8
0014	45	1L	9.39 +	8
0015	48	2L	9.07	8

* = standard mean nursery flour protein = 6.6 mill used = Quad

CLUB	9.09	8
CLUB	9.18	8
CLUB	0.141	0.5
CLUB	9.09	8
SWW	9.32	8
SWW		

COMMENTS: Selection OR855 was not processed in this nursery.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0001	860074-1H-OP-4P	7	CLUB	58.4 -	43	8.1	--Lost due to milling error--					
0002	860018-2H-OP-90P	16	CLUB	60.3	46	9.0	67.8 -	38.0	0.29 +2	89.0	7.4	49.9
0003	860118-2H-OP-93P	17	CLUB	58.9 -	33	8.5	69.3	41.3	0.32 +	89.0	7.3	49.8
0004	860118-2H-OP-123P	18	CLUB	59.6	34	8.7	67.8 -	37.6	0.30 +2	88.3	7.1	49.9
0005	860118-2H-OP-207P	23	CLUB	60.0	28	7.9	68.9	42.5	0.32 +	88.5	6.6	51.1
0006	860118-2H-OP-222P	26	CLUB	58.7 -	28	8.9	67.3 -	36.2	0.32 +	86.4	7.1	50.8
0007	860118-2H-OP-228P	28	CLUB	59.2	37	8.8	66.5 -2	40.6	0.32 +	85.4	7.0	49.7
0008	860118-2H-OP-276P	31	CLUB	59.1	27	8.0	67.7 -	42.5	0.33	86.3	6.8	49.3
0009	860118-2H-OP-278P	32	CLUB	60.4	38	9.5	66.3 -2	36.5	0.33	84.5 -	7.6	49.7
0010	860118-2H-OP-312P	33	CLUB	58.0 -	30	8.6	68.5	42.5	0.31 +	88.6	7.0	50.9
0011	860118-2H-OP-443P	35	CLUB	59.6	36	7.8	69.3	42.1	0.31 +	89.6 +	6.6	48.7
0012	860118-2H-OP-559P	37	CLUB	60.3	39	8.4	67.1 -2	41.6	0.30 +2	87.5	6.9	49.9
0013	860118-2H-OP-573P	38	CLUB	59.6	35	8.4	67.6 -	41.8	0.30 +2	88.1	6.8	49.9
0014	860118-2H-OP-673P	40	CLUB	58.5 -	37	8.6	66.1 -2	41.3	0.29 +2	86.8	6.9	50.4
*0015	PAMA	41	CLUB	60.7	32	8.1	69.4	38.0	0.35	87.2	6.7	49.7
0016	TRES	42	CLUB	60.4	31	7.4	67.7 -	39.0	0.32 +	86.9	6.1	53.9 -
0017	OR855	43	CLUB	62.0	36	8.3						
0018	HYAK	44	CLUB	60.1	37	8.5	67.3 -	35.4	0.31 +	87.1	6.8	52.8 -
0019	STEPHENS	45	SWW	59.2	40	8.5	69.2	36.4	0.33	88.2	7.3	50.2
0020	860118-2H-OP-1846P	46	CLUB	60.6	35	8.4	67.7 -	36.2	0.34	85.7	7.0	50.7
0021	860119-2H-OP-49P	47	CLUB	59.9	37	8.4	68.6	38.8	0.33	87.5	6.9	49.8
0022	860119-2H-OP-78P	48	CLUB	60.4	44	8.1	68.1 -	35.4	0.32 +	87.5	6.8	49.6

* = standard mean nursery flour protein = 6.9 mill used = Quad

[illegible]

SAMPLE#	BREEDER#	MTYPE	COOI	TGS
0001	7			
0002	16	1L	9.21 -	8
0003	17	2L	9.15 -2	7 -
0004	18	2L	8.99 -2	7 -
0005	23	1L	9.26 -	8
0006	26	1L	8.77 -2	7 -
0007	28	2L	9.68	9
0008	31	2L	9.25 -	8
0009	32	2L	9.23 -	8
0010	33	1L	9.16 -2	7 -
0011	35	1L	8.97 -2	7 -
0012	37	2L	8.96 -2	7 -
0013	38	3L	9.02 -2	7 -
0014	40	3L	8.94 -2	7 -
*0015	41	2L	9.68	9
0016	42	3L	8.94 -2	7 -
0017	43			
0018	44	1L	9.06 -2	7 -
0019	45	3L	9.10 -2	7 -
0020	46	1L	9.19 -	7 -
0021	47	2L	9.15 -2	8
0022	48	1L	8.96 -2	7 -

* = standard mean nursery flour protein = 6.9 mill used = Quad

CLUB	9.68	9
CLUB	9.14	7
CLUB	0.233	0.7
CLUB	9.68	9
SWW	9.10	7
SWW		

COMMENTS: Sample #-0001 (Breeder number 7) was lost due to a milling error. Selection OR855 was not processed in this nursery.

SAMPLE#	BREEDER#	MTYPE	COOI	TGS
0001	12	2L	9.09 -	8
0002	14	3L	9.05 -	8
0003	15	2L	9.01 -	7 -
0004	17	1L	9.27	8
0005	18	4L	9.18 -	8
0006	21	4L	9.43	8
0007	23	1L	9.14 -	7 -
0008	24	1L	9.31	8
0009	25	1L	9.21 -	8
0010	26	1L	9.20 -	8
0011	27	2L	8.99 -	7 -
0012	28	3L	9.16 -	8
0013	30	1L	8.88 -2	7 -
0014	31	2L	9.44	8
0015	32	2L	9.19 -	8
0016	33	3L	9.02 -	7 -
0017	36	2L	9.20 -	8
0018	38	2L	8.98 -	7 -
0019	39	3L	8.85 -2	8
0020	40	3L	9.14 -	8
*0021	44	2L	9.48	9
0022	45	2L	9.11 -	8
0023	46			
0024	47	1L	8.84 -2	7 -
0025	48	3L	9.31	8

* = standard mean nursery flour protein = 6.4 mill used = Quad

CLUB	9.48	9
CLUB	9.14	8
CLUB	0.176	0.5
CLUB	9.48	9
SWW	9.31	8
SWW		

COMMENTS: Selection OR855 was not processed in this nursery.

SAMPLE#	BREEDER#	MTYPE	CODI	TGS
0001	3	1L	9.31	8
0002	8	1L	8.77 -2	8
0003	21	1L	8.95 -	8
0004	31	1L	8.89 -	8
0005	33	1L	9.04 -	8
0006	34	1L	9.09	8
0007	35	1L	9.40	9
0008	36	1L	8.98 -	7 -
0009	38	1L	9.20	8
0010	40	1L	9.49	8
0011	41	2L	8.96 -	7 -
0012	42	1L	9.10	7 -
*0013	44	1L	9.30	9
0014	45	2L	8.99 -	7 -
0015	46			
0016	47	2L	8.95 -	8
0017	48	2L	9.05	7 -

* = standard mean nursery flour protein = 6.2 mill used = Quad

CLUB 9.30 9

CLUB 9.09 8

CLUB 0.204 0.6

CLUB 9.30 9

SWW 9.05 7

SWW

COMMENTS: Selection OR855 was not processed in this nursery.

SAMPLE#	BREEDER#	MTYPE	COOI	TGS
0001	1	1L	9.02 -	8
0002	2	1L	9.01 -	8
0003	3	3L	9.47	8
0004	5	1L	9.02 -	7
0005	6	1L	9.04 -	7
0006	7	3L	9.52	8
0007	8	1L	9.12	8
0008	9	1L	9.27	8
0009	11	1L	8.80 -2	8
0010	12	1L	9.32	8
0011	15	1L	8.90 -	8
0012	16	1L	9.15	8
0013	17	1L	9.48	9
0014	18	1L	9.39	10 +
0015	19	1L	8.98 -	7
0016	20	1L	9.35	8
0017	21	1L	9.10	7
0018	22	4L	9.20	7
0019	24	1L	9.00 -	8
0020	27	1L	9.51	9
0021	29	1L	8.94 -	8
0022	30	1L	8.95 -	7
0023	35	2L	9.09 -	8
0024	36	2L	9.34	7
*0025	44	2L	9.35	8
0026	45	3L	8.95 -	7
0027	46			
0028	47	3L	8.84 -	8
0029	48	4L	9.14	8

* = standard mean nursery flour protein = 6.1 mill used = Quad

CLUB	9.35	8
CLUB	9.15	8
CLUB	0.217	0.7
CLUB	9.35	8
SWW	9.14	8
SWW		

COMMENTS: Selection OR855 was not processed in this nursery.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0001	.	1	CLUB	58.2	60	6.7	69.7 +2	39.8	0.39	85.0 +	5.4	49.9 +
0002	.	2	CLUB		36							
0003	.	3	CLUB		52							
0004	.	4	HRW	55.8 -2	71	7.3	63.4 -2	31.1	0.39	78.2 -2	5.8	53.5
0005	.	5	SWW	57.3 -	31	7.9	69.8	38.1	0.40	84.5	6.5	51.7
0006	.	6	SWW	57.3 -	30	7.5	65.6 -2	35.0	0.38 +	80.4 -	6.0	50.9
0007	.	7	SRW	59.9	35	8.2	68.8	34.8	0.37 +	85.2	6.6	50.5
0008	.	8	CLUB	57.8	31	7.1	68.3	37.5	0.40	82.6	6.0	50.9
0009	.	9	SWW	57.7 -	26	7.3	66.5 -2	36.9	0.42	79.0 -2	6.3	50.8
0010	.	10	SWW	58.5	25	7.4	67.7 -	36.9	0.40	81.8	6.4	51.3
0011	.	11	SWW	57.1 -	34	7.1	67.0 -	39.0	0.40	81.0 -	5.5	51.3
0012	.	12	SWW	57.8 -	44	8.0	68.5	35.6	0.39	83.5	6.6	50.8
0013	.	13	CLUB	58.0	48	6.1	65.7 -	36.2	0.42 -	78.0 -	5.0	52.3
0014	.	14	SWW	60.1	29	7.7	67.4 -	33.7	0.40	81.5	6.2	50.6
0015	.	15	SWW	58.2	30	7.6	66.6 -2	36.6	0.41	79.8 -	6.2	50.6
0016	.	16	HRW	57.3 -	76	7.9	64.1 -2	30.7	0.43 -	76.9 -2	6.3	52.4
0017	.	17	SWW	60.4	41	7.7	67.6 -	34.5	0.44 -	79.2 -2	6.4	50.8
0018	.	18	HRW	59.3	53	9.6 -	63.6 -2	32.0	0.39	78.4 -2	7.8	52.2
0019	.	19	SWW	56.9 -	21	7.3	67.8 -	39.5	0.41	81.3 -	5.9	51.3
*0020	HILL-81	20	SWW	59.6	37	7.6	69.0	39.5	0.40	83.5	6.5	51.2
0021	.	21	CLUB	60.5	32	7.2	64.9 -2	36.6	0.40	78.3 -	6.0	51.2
*0022	HYAK	22	CLUB	59.2	39	7.5	67.3	37.5	0.39	82.0	6.1	53.3

* = standard mean nursery flour protein = 6.2 mill used = Quad

Standard Mean	CLUB	39	7.5	67.3	37.5	0.39	82.0	6.1	53.3
Nursery Mean	CLUB	43	6.9	67.2	37.5	0.40	81.2	5.7	51.5
Nursery Standard deviation	CLUB	11.0	0.54	1.94	1.40	0.012	2.99	0.48	1.31
Standard Mean	SWW	37	7.6	69.0	39.5	0.40	83.5	6.5	51.2
Nursery Mean	HRW	71	7.3	63.4	31.1	0.39	78.2	5.8	53.5
Nursery Standard deviation	HRW								
Standard Mean	SWW	37	7.6	69.0	39.5	0.40	83.5	6.5	51.2
Nursery Mean	SWW	32	7.6	67.6	36.8	0.40	81.4	6.2	51.0
Nursery Standard deviation	SWW	7.1	0.27	1.19	2.02	0.016	1.81	0.32	0.35
Standard Mean	SWW	37	7.6	69.0	39.5	0.40	83.5	6.5	51.2
Nursery Mean	SRW	35	8.2	68.8	34.8	0.37	85.2	6.6	50.5
Nursery Standard deviation	SRW								
Standard Mean	SWW	37	7.6	69.0	39.5	0.40	83.5	6.5	51.2
Nursery Mean	HRW	64	8.8	63.8	31.4	0.41	77.7	7.1	52.3
Nursery Standard deviation	HRW	16.3	1.20	0.35	0.92	0.028	1.06	1.06	0.14

SAMPLE#	BREEDER#	MTYPE	CODI	TGS	RVA	COLOR
0001	1					
0002	2	1L	8.96	6	195	
0003	3					
0004	4	2L	8.59 -2	5 -	123	
0005	5	3L	8.95	7	124	
0006	6	3L	9.14	8	135	
0007	7	3L	9.10	6	162	
0008	8	2L	9.26	7	174	
0009	9	1L	9.02	6	123	
0010	10	1L	9.09	8	157	
0011	11	1L	9.36	8	129	
0012	12	3L	8.90	6	152	U
0013	13	1L	8.61 -2	7	153	U
0014	14	3L	8.99	7	171	
0015	15	1L	9.04	7	153	
0016	16	1L	8.50 -2	5 -	125	Q
0017	17	3L	8.73 -	7	166	U
0018	18	3L	8.93	6	143	U
0019	19	1L	9.43 +	8	157	
*0020	20	3L	9.15	7	157	
0021	21	2L	9.15	7	202	
*0022	22	3L	9.16	7	172	

* = standard mean nursery flour protein = 6.2 mill used = Quad

CLUB 9.16 7 172
 CLUB 9.03 7 179
 CLUB 0.258 0.4 19.6

SWW 9.15 7 157
 HRW 8.59 5 123
 HRW

SWW 9.15 7 157
 SWW 9.07 7 148
 SWW 0.198 0.8 16.9

SWW 9.15 7 157
 SRW 9.10 6 162
 SRW

SWW 9.15 7 157
 HWW 8.72 6 134
 HWW 0.304 0.7 12.7

COMMENTS: This nursery consists of winter wheat selections showing resistance to foot rot at the Columbia Basin Agricultural Research Center near Pendleton, OR. This set of selections was harvested before pre-harvest rain. Another set of selections making up part of this nursery was harvested after the rain and their quality data is reported in Nursero 26. Quality parameters of CLUB selections in this nursery were graded by comparison to the standard mean of Hyak. Quality parameters of HRW, HWW, SWW and SRW selections were graded by comparison to the standard mean of Hill 81. Two CLUB selections, Breeder #'s 1 and 3 were excluded from further tests due to having wheat hardness values greater than 50. Cookies were baked on all selections. No bread was baked on any HRW or HWW selections due to their very poor mixogram properties (short mixing time and very weak mixing properties). Rapid Visco Analyzer viscosity (RVA) was run on all selections. RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable.

Alkaline flour color (COLOR) was scored on those selections having a minimum RVA value of 150 and a minimum wheat hardness value (UWHRD) of 40. *Color represents an extremely important quality criterion in Asian types of noodles. A preliminary alkaline flour color test was initiated. An alkaline Pekar slick was used to subjectively measure flour color. The Pekar slick was prepared by pressing flour to a smooth surface, immersing in a 1.0% alkaline solution consisting of 60% K₂CO₃ and 40% Na₂CO₃ for 2 minutes. The sample rested at a room temperature of (77°F) for 4 hours before visual observation and scoring. Flours were scored by the following; S = satisfactory, Q = questionable, and U = unsatisfactory. Desirable flour color ranges from bright white through creamy yellow to bright yellow. Any dullness, brown, or greenish casts would be unacceptable. Alkaline flour color (COLOR) is scored only on SWW, HWW, SWS and HWS wheats which have a minimum RVA viscosity of 150 and a minimum NIR wheat hardness (UWHRD) value of 40.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
*0001	STEPHENS	1	SWW	58.5	27	10.6	67.7	37.1	0.31	87.6	8.9	52.7
0002	VH090292	2	SWW	61.0 +	28	11.1	63.7 -2	34.6	0.34 -	80.6 -2	9.4	57.7 -
0003	N8708902	3	HWW	60.3	62	12.3 +	65.3	30.3	0.29 +2	85.4 +	10.5	61.0
0004	N8708902	4	SWW	61.9 +2	36	11.5	66.5 -	30.9	0.27 +	88.6	9.3	54.3
0005	N8810201	5	HWW	61.4	74	12.0	67.0 +2	27.9	0.30 +	86.7 +2	10.4	59.7
0006	RE869471	6	HWW	57.5 -2	55	10.8	65.6	33.1	0.36 -	82.1	9.5	57.5
0007	RE87465	7	HWW	61.0	61	10.6	62.0 -2	25.7	0.28 +2	82.5	9.0	54.0 -
0008	VH087450	8	SWW	60.8 +	28	10.6	68.0	37.2	0.32	87.3	8.9	51.9
0009	VH088088	9	HWW	59.9	71	11.6	63.7	28.0	0.32 +	82.2	9.9	57.8
0010	VH088527	10	HWW	59.4	68	10.4	66.8 +2	32.0	0.30 +	86.5 +2	8.9	57.0
0011	VH088581	11	SWW	57.9	37	11.3	65.5 -	37.3	0.30	85.4 -	9.4	53.7
0012	VH088590	12	SWW	58.3	34	11.9	66.8	36.1	0.31	86.4	9.8	52.1
0013	VMSR8904	13	HWW	61.0	66	11.2	61.2 -2	25.1	0.31 +	80.1	9.6	59.3
0014	VMSR8906	14	HWW	61.0	50	10.7	62.5 -	27.9	0.32 +	80.9	9.2	56.0 -
0015	VMSR8907	15	HWW	59.8	53	11.0	64.5	28.2	0.34	82.0	9.2	55.0 -
0016	D8901301	16	HWW	61.2	81	11.7	64.7	31.2	0.30 +	84.3 +	10.6	58.2
0017	VM911003	17	HWW	60.7	75	12.6 +	64.9	30.2	0.31 +	84.0	11.4 +	59.2
0018	D8911401	18	HWW	59.9	72	11.7	63.6	28.2	0.32 +	82.1	10.5	60.5
0019	D9000901	19	HWW	60.8	64	10.9	60.8 -2	29.4	0.29 +2	80.7	9.4	59.1
0020	D9002601	20	HWW	60.7	72	10.7	63.7	28.9	0.35	80.6	9.5	61.2
*0021	COULEE	21	HWW	61.1	68	10.5	64.6	32.3	0.34	82.1	9.6	59.0
0022	VH091375	22	SWW	59.1	40	10.7	65.2 -2	36.3	0.30	85.0 -	9.0	54.8
0023	VH091372	23	HWW	60.7	74	12.3 +	64.6	27.8	0.31 +	83.7	10.9	60.0
0024	VH090295	24	SWW	60.3 +	41	11.0	66.7	35.6	0.30	86.9	9.0	53.7
0025	VH090296	25	SWW	60.3 +	34	12.1	64.8 -2	34.3	0.30	84.5 -	9.9	59.6 -2
0026	VH090297	26	HWW	60.1	77	11.0	63.9	27.5	0.36 -	80.3	9.6	58.5
0027	VH090324	27	HWW	60.2	68	11.3	65.1	28.0	0.31 +	84.2	9.7	58.0
0028	VH090334	28	HWW	60.2	80	10.9	65.1	27.2	0.34	82.6	9.5	56.6
0029	VH090335	29	HWW	59.0 -	70	10.7	61.9 -2	26.3	0.36 -	78.2 -	9.6	55.5 -
0030	VH090369	30	SWW	56.0 -	46	11.3	63.0 -2	32.6	0.34 -	79.7 -2	9.3	52.8
0031	VM911002	31	SWW	60.3 +	34	12.9 -	66.8	32.6	0.35 -	83.9 -	10.7 -	59.8 -2
0032	VH090378	32	HWW	59.4	58	10.7	66.5 +	32.3	0.31 +	85.6 +	9.6	58.1
0033	VH090385	33	HWW	61.2	61	10.6	67.6 +2	28.9	0.36 -	84.2	9.2	57.3
0034	VH090453	34	SWW	56.2 -	31	10.8	66.7	34.1	0.31	86.3	8.9	55.3
0035	VH090641	35	HWW	60.2	64	13.0 +	62.4 -	26.4	0.36 -	78.8 -	11.2 +	60.6
0036	VM911001	36	HWW	59.5	74	13.4 +	64.8	28.2	0.35	81.8	11.6 +	58.8
0037	WA007679	37	HWW	61.0	62	11.9	65.1	32.1	0.31 +	84.2	10.5	58.8
0038	VM911009	38	HWW	60.0	55	11.5	64.9	30.8	0.28 +2	85.5 +	10.0	57.8
0039	VM911010	39	SWW	60.0	49	11.9	67.1	32.6	0.30	87.5	9.7	53.7
0040	VB091012	40	HWW	61.4	79	12.6 +	66.2 +	31.4	0.29 +2	86.4 +2	11.0	60.5

* = standard mean nursery flour protein = 9.7 mill used = Quad

* = standard
mean nursery flour protein = 9.7 mill used = Quad

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UNHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0041	VH091505	41	HWW	60.3	66	11.9	67.3 +2	33.7	0.29 +2	87.5 +2	9.7	56.0 -
0042	VH091548	42	HWW	60.9	78	11.3	64.1	27.0	0.29 +2	84.2	9.6	57.1
0043	VH091552	43	HWW	60.5	73	11.1	66.4 +	33.3	0.30 +	86.1 +	9.6	57.1
0044	VH091753	44	HWW	59.9	76	10.8	66.2 +	31.2	0.32 +	84.8 +	9.4	58.0
0045	VM911021	45	HWW	59.6	50	13.4 +	63.7	30.5	0.30 +	83.2	11.0	58.8
0046	VM911022	46	HWW	60.7	63	11.4	66.9 +2	32.3	0.29 +2	87.1 +2	10.0	58.1
0047	VM911023	47	SWW	58.5	34	10.6	67.3	36.6	0.33 -	85.8	8.5	52.8
0048	LEWJAIN	48	SWW	60.2 +	21	11.1	65.9 -	38.4	0.32	84.6 -	8.9	53.7
0049	VH091459	49	HWW	59.6	79	12.4 +	62.4 -	23.0	0.31 +	81.4	10.0	54.6 -
0050	VH091492	50	HWW	59.9	73	11.1	65.7	30.6	0.31 +	84.8 +	10.0	55.3 -
0051	VH091506	51	HWW	61.3	94	10.9	63.8	26.2	0.32 +	82.3	9.2	56.1 -
0052	VH091532	52	HWW	60.4	76	11.1	66.7 +	28.5	0.29 +2	86.9 +2	9.9	57.0
0053	VH091571	53	HWW	59.0 -	65	11.1	65.3	30.1	0.30 +	84.9 +	9.7	55.5 -
0054	VH091634	54	HWW	60.8	74	12.3 +	62.6 -	26.7	0.31 +	81.6	9.8	56.1 -
0055	VH091649	55	HWW	60.1	80	10.4	64.5	28.2	0.32 +	83.0	8.9	52.6 -2
0056	VH091725	56	HWW	60.4	78	11.2	66.6 +	33.2	0.29 +2	86.8 +2	9.9	57.5

* = standard mean nursery flour protein = 9.7 mill used = Quad

Standard Mean
Nursery Mean

Nursery Standard deviation

Standard Mean
Nursery Mean

Nursery Standard deviation

52.7
54.6
2.52
59.0
57.7
1.98

8.9
9.3
0.55
9.6
9.9
0.68

87.6
85.3
2.49
82.1
83.5
2.37

0.31
0.31
0.021
0.34
0.31
0.024

37.1
35.1
2.19
32.3
29.3
2.54

67.7
66.1
1.43
64.6
64.7
1.73

10.6
11.3
0.67
10.5
11.4
0.81

27
35
7.4
68
69
9.4

58.5
59.3
1.71
61.1
60.3
0.79

SWW
SWW
SWW
HWW
HWW
HWW

SAMPLE#	BREEDER#	MTYPE	CODI	TGS	BABS	MTIME	LVOL	BCRGR	PROQ	RVA	COLOR*
0041	41	3M	8.24	5						206	S
0042	42	2M	8.14	5						185	S
0043	43	2M	8.26	5						202	Q
0044	44	6M	8.41	4	62.2	2.8	780	6	+1	212	S
0045	45	4M	8.24	3	62.5	3.6	845	5	0	197	Q
0046	46	2M	8.44	4						200	S
0047	47	2M	9.35	9 +						177	
0048	48	3M	9.30	8						196	
0049	49	1M	8.18	5						203	S
0050	50	2M	8.75	5						197	S
0051	51	3M	8.15	3						183	S
0052	52	3M	8.30	3						158	Q
0053	53	4M	8.38	5						198	S
0054	54	4M	8.04	6 +	61.3	3.6	710 -2	8	-1	192	S
0055	55	3M	8.31	4						170	S
0056	56	4M	8.53	6 +	59.7 -	2.4 -	800	5	0	203	S

* = standard mean nursery flour protein = 9.7 mill used = Quad

SWW	9.43	7	149
SWW	8.97	7	172
SWW	0.285	1.4	24.8

HWW	8.39	4	62.2	4.1	820	5	181
HWW	8.40	4	62.1	3.2	819	5	189
HWW	0.188	1.4	1.45	0.99	41.7	1.1	19.2

COMMENTS: Quality parameters of SWW selections in this nursery were graded by comparison to the standard mean of Stephens. Quality parameter of HWW selections were graded by comparison to the standard mean of Coulee. Cookies were baked on all lines. Bread was baked only on those HWW lines whose mixograms showed the most potential for decent bread quality (stronger mixing properties). Rapid Visco Analyzer (RVA) viscosity was run on all selections. RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable.

Alkaline flour color (COLOR) was scored on those selections having a minimum RVA value of 150 and a minimum wheat hardness (UWHRD) value of about 40. *Color represents an extremely important quality criterion in Asian types of noodles. A preliminary alkaline flour color test was initiated. An alkaline Pekar slick was used to subjectively measure flour color. The Pekar slick was prepared by pressing flour to a smooth surface, immersing in a 1.0% alkaline solution consisting of 60% K₂CO₃ and 40% Na₂CO₃ for 2 minutes. The sample rested at a room temperature of (77°F) for 4 hours before visual observation and scoring. Flours were scored by the following; S = satisfactory, Q = questionable, and U = unsatisfactory. Desirable flour color ranges from bright white through creamy yellow to bright yellow. Any dullness, brown, or greenish casts would be unacceptable. Alkaline flour color (COLOR) is scored only on SWW, HWW, SWS and HWS wheats which have a minimum RVA viscosity of 150 and a minimum NIR wheat hardness (UWHRD) value of 40.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0001	.	23	SWW	56.4 -	20	6.6	68.1	41.6	0.42	81.1	5.4	50.9
0002	.	24	SWW	57.5	44	6.8	66.5	36.6	0.42	79.0	5.4	51.4
0003	.	25	SWW	56.6	28	7.6	68.5 +	38.5	0.41	82.2	5.8	51.9
0004	.	26	CLUB	59.1	15	6.6	64.7 -2	38.8	0.42	76.8 -	5.3	51.4
0005	.	27	SWW	56.5 -	37	6.6	64.8 -2	35.2	0.44 -	75.6 -2	5.1	52.6
0006	.	28	SWW	57.3	38	7.1	64.8 -2	35.9	0.41	77.5 -	5.5	51.6
0007	.	29	SWW	53.6 -2	42	6.5	67.6	41.0	0.48 -2	76.6 -	5.0	52.4
0008	RENDEZVOUS	30	SRW	53.9 -2	49	6.3	64.3 -2	38.4	0.45 -	74.3 -2	4.9	51.9
0009	STEPHENS	31	SWW	57.3	25	6.7	64.8 -2	38.3	0.43 -	76.2 -2	5.6	51.4
*0010	HILL-81	32	SWW	58.2	21	6.7	67.2	40.0	0.41	80.6	5.6	51.3

* = standard mean nursery flour protein = 5.4 mill used = Quad

Standard Mean	SWW	21	58.2	67.2	40.0	0.41	80.6	5.6	51.3
Nursery Mean	SWW	32	56.7	66.5	38.4	0.43	78.6	5.4	51.7
Nursery Standard deviation	SWW	9.5	1.38	1.55	2.39	0.024	2.49	0.27	0.58
Standard Mean	SWW	21	58.2	67.2	40.0	0.41	80.6	5.6	51.3
Nursery Mean	CLUB	15	59.1	64.7	38.8	0.42	76.8	5.3	51.4
Nursery Standard deviation	CLUB								
Standard Mean	SWW	21	58.2	67.2	40.0	0.41	80.6	5.6	51.3
Nursery Mean	SRW	49	53.9	64.3	38.4	0.45	74.3	4.9	51.9
Nursery Standard deviation	SRW								

SAMPLE#	BREEDER#	MTYPE	CODI	TGS	RVA
0001	23	1L	9.36	9	127
0002	24	1L	8.75	6	139
0003	25	1L	8.93	7	163
0004	26	1L	9.56	9	199
0005	27	1L	8.89	7	127
0006	28	1L	9.35	7	158
0007	29	1L	8.93	7	104
0008	30	1L	8.65	6	139
0009	31	1L	9.24	7	162
*0010	32	1L	9.25	8	161

* = standard mean nursery flour protein = 5.4 mill used = Quad

SWW	9.25	8	161
SWW	9.09	7	143
SWW	0.238	0.9	21.9
SWW	9.25	8	161
CLUB	9.56	9	199
CLUB			
SWW	9.25	8	161
SRW	8.65	6	139
SRW			

COMMENTS: This nursery consists of winter wheat selections showing resistance to foot rot at the Columbia Basin Agricultural Research Center near Pendleton, OR. This set of selections was harvested after receiving 1.36 inches of rain. Another set of selections making up part of this nursery was harvested before pre-harvest rain and their quality data is reported in Nursco 21. Quality parameters of SWW, SRW and CLUB selections in this nursery were graded by comparison to the standard mean of Hill 81. Cookies were baked on all selections. Rapid Visco Analyzer viscosity (RVA) was run on all selections; RVA is a hot-pasting viscosity measurement. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable.

Alkaline flour color (COLOR) was not scored on any selections since RVA was either less than 150 and/or wheat hardness less than 40. *Color represents an extremely important quality criterion in Asian types of noodles. A preliminary alkaline flour color test was initiated. An alkaline Pekar slick was used to subjectively measure flour color. The Pekar slick was prepared by pressing flour to a smooth surface, immersing in a 1.0% alkaline solution consisting of 60% K₂CO₃ and 40% Na₂CO₃ for 2 minutes. The sample rested at a room temperature of (77°F) for 4 hours before visual observation and scoring. Flours were scored by the following; S = satisfactory, Q = questionable, and U = unsatisfactory. Desirable flour color ranges from bright white through creamy yellow to bright yellow. Any dullness, brown, or greenish casts would be unacceptable. Alkaline flour color (COLOR) is scored only on SWW, HWW, SWS and HWS wheats which have a minimum RVA viscosity of 150 and a minimum NIR wheat hardness (UWHRD) value of 40.

SAMPLE#	BREEDER#	MTYPE	CODEI	TGS	CAVOL	SCSCOR
0001	1	3L	9.02	8		
0002	2					
0003	3	2L	9.05	8		
0004	4	2L	8.99	8		
0005	5	2L	9.25	8		
0006	6	6L	9.41 +	9		
0007	7					
0008	8	2M	8.96	6 -		
0009	9	3L	8.84 -	8		
0010	10	2L	9.32	9		
0011	11	1L	8.85 -	6 -		
0012	12	2L	8.93	7		
0013	13					
0014	14					
0015	15	1L	9.06	8		
0016	16	1L	9.05	7	1295 -	75
0017	17	1L	9.00	7		
0018	18	2L	8.90	8		
0019	19	2L	9.30	8		
0020	20	3L	8.99	8		
0021	21					
0022	22	2L	9.18	8		
0023	23	3L	9.07	8		
0024	24	2L	9.06	8		
0025	25	2M	9.05	8		
0026	26	2L	8.93	7	1230 -2	70 -
0027	27					
0028	28	3L	9.06	7		
*0029	29	1L	9.41 +	9	1365	78
*0030	30	2L	8.88 -	7	1330	77

* = standard mean nursery flour protein = 6.6 mill used = Quad

CLUB	9.14	8	1348	78
CLUB	9.07	8	1305	75
CLUB	0.169	0.8	57.6	3.6
CLUB	9.14	8	1348	78
SWW	9.06	7		
SWW				

COMMENTS: Quality parameters of CLUB selections in this nursery were graded by comparison to the standard mean of Omar and Hyak. Breeder #'s 2, 7, 13, 14 & 21 were excluded from further testing due to having NIR wheat hardness values greater than 50. Selection 0R855 was not processed for quality in this nursery. Cookies were baked on all lines. Only breeder #'s 16 & 26, plus the check varieties (Omar and Hyak) were evaluated for sponge cake quality. These two selections were originally stated to be Buhler milled and evaluated for cookie and sponge cake quality, however they were Quadrumat milled instead.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	FASH	MSCOR	FPROT	MABS	MTYPE
0001	88CL0124	1	CLUB	60.7	25	6.4	68.3 -2	0.36 +2	85.2	5.2	50.0	1L
0002	90CL0121	2	CLUB	58.2 -	31	7.8	69.2 -2	0.37 +2	85.7	6.6 -	51.0	3L
0003	90CL0126	4	CLUB	60.3	23	7.5	67.7 -2	0.36 +2	84.4 -	6.4	51.0	1L
0004	90CL0128	5	CLUB	59.9	24	7.6	68.5 -2	0.35 +2	86.1	5.6	50.1	1L
0005	90CL0132	7	CLUB	60.0	30	6.6	67.8 -2	0.34 +2	85.8	5.3	50.4	1L
0006	90CL0135	9	CLUB	59.8	24	8.3 -	67.3 -2	0.33 +2	85.8	6.7 -	51.6	3L
0007	88CL0349	10	CLUB	61.3	27	7.0	66.9 -2	0.33 +2	85.3	5.7	51.1	2L
0008	90CL0157	11	CLUB	57.7 -	31	5.9	66.8 -2	0.37 +2	82.6 -2	4.4	53.1	1L
0009	90CL0159	12	CLUB	58.0 -	26	7.0	65.2 -2	0.37 +2	80.6 -2	5.9	51.8	1L
0010	90CL0173	13	CLUB	59.7	28	7.5	68.0 -2	0.33 +2	86.7	6.0	51.1	6L
0011	90CL0166	14	CLUB	60.3	29	6.7	68.0 -2	0.34 +2	86.1	5.3	51.3	1L
0012	90CL0158	17	CLUB	59.3	21	6.1	66.0 -2	0.37 +2	81.6 -2	4.9	51.5	1L
0013	90CL0161	18	CLUB	59.2	28	7.1	68.3 -2	0.33 +2	87.1	5.8	52.1	1L
0014	90CL0150	22	CLUB	61.0	30	6.8	67.7 -2	0.36 +2	84.4 -	5.5	52.1	2L
0015	TRES	30	CLUB	61.1	32	6.7	66.5 -2	0.35 +2	83.5 -	5.4	53.1	1L
*0016	HYAK-TRES MIX	36	CLUB	59.9	27	6.4	68.6 -2	0.34 +2	86.8	5.1	51.3	1L

* = standard mean nursery flour protein = 5.6 mill used = Quad

Standard Mean
Nursery Mean
Nursery Standard deviation

CLUB 59.9 27 6.4 34.5 34.47 86.8 5.1 51.3
CLUB 59.8 27 7.0 33.9 33.95 84.9 5.6 51.4
CLUB 1.08 3.2 0.65 34.15 34.145 1.90 0.62 0.90

SAMPLE#	BREEDER#	CODI	TGS
0001	1	9.10	8
0002	2	9.12	7
0003	4	9.25 +	8
0004	5	9.29 +	7
0005	7	8.93	5 -
0006	9	9.15	8
0007	10	9.60 +2	9 +
0008	11	9.00	7
0009	12	9.28 +	7
0010	13	9.19	8
0011	14	9.09	7
0012	17	8.89	6
0013	18	9.26 +	8
0014	22	9.21 +	8
0015	30	9.03	8
*0016	36	8.94	7

* = standard mean nursery flour protein = 5.6 mill used = Quad

CLUB 8.94 7
CLUB 9.15 7
CLUB 0.177 1.0

SAMPLE#	BREEDER#	MTYPE	CODI	TGS	CAVOL	SCSCOR
0001	3	1L	8.93	8	1350	78
0002	6	4L	8.84	7	1300 -	73 -
0003	8	1L	8.93	8	1320 -	75 -
0004	15	2L	9.29 +	8	1360	81
0005	16	1L	8.93	8	1385	82
0006	19	4L	9.32 +	8	1385	82
0007	20	1L	9.19 +	8	1415 +	82
0008	21	1L	8.90	7	1370	81
0009	23	1L	8.65	7	1375	81
0010	24	1L	8.54 -	7	1340	76
0011	25	1L	9.01	7	1380	82
*0012	26	2L	9.06	7	1365	78
*0013	27	1L	8.70	7	1380	83
0014	28	1L	9.38 +	8	1355	80
0015	29					
0016	30	1L	9.18 +	8	1320 -	77
0017	31	1L	9.01	7	1305 -	74 -
0018	32	1L	9.15 +	7	1355	80
0019	33	1L	8.94	8	1290 -2	75 -
0020	34	1L	9.11	7	1295 -	75 -
0021	35	1L	9.11	8	1305 -	76

* = standard mean nursery flour protein = 6.0 mill used = Buhler

CLUB	8.88	7	1372	80
CLUB	9.01	8	1348	79
CLUB	0.221	0.5	36.1	4.3

COMMENTS: Quality parameters of CLUB selections in this nursery were graded by comparison to the standard mean of Omar and Hyak. Stephens was not processed for quality in this nursery.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0001	88CL0124	1	CLUB	61.3	43	9.4	67.3 -	35.1	0.39 -	82.0 -2	7.8	51.8
0002	90CL0121	2	CLUB	56.5 -2	39	9.3	68.2	37.3	0.40 -2	82.5 -2	7.9	51.6
0003	90CL0126	4	CLUB	60.7	36	11.8 -2	66.7 -2	32.9	0.34	84.4 -	9.8 -	51.7
0004	90CL0128	5	CLUB	60.9	44	11.2 -	66.7 -2	31.0	0.34	84.4 -	9.5 -	51.6
0005	90CL0132	7	CLUB	60.2	37	8.3	66.9 -	37.1	0.35	84.0 -	6.8	50.8
0006	90CL0135	9	CLUB	59.5	31	10.0	66.8 -2	35.6	0.33	85.2	8.8 -	52.7 -
0007	88CL0349	10	CLUB	62.0 +	29	8.8	68.4	36.7	0.41 -2	82.1 -2	7.3	50.7
0008	90CL0157	11	CLUB	58.5	53	8.5	66.9 -	32.3	0.42 -2	79.6 -2	7.2	49.7
0009	90CL0159	12	CLUB	55.9 -2	36	10.6 -	64.2 -2	32.9	0.39 -	78.0 -2	8.8 -	52.2
0010	90CL0173	13	CLUB	59.5	44	9.4	67.2 -	36.8	0.35	84.4 -	8.1	50.9
0011	90CL0166	14	CLUB	59.0	37	8.5	67.2 -	34.4	0.39 -	81.8 -2	7.2	50.8
0012	90CL0158	17	CLUB	59.0	28	8.9	65.7 -2	36.6	0.40 -2	79.3 -2	7.1	50.4
0013	90CL0161	18	CLUB	59.7	35	9.6	68.1	37.4	0.34	86.2	8.1	49.8
0014	90CL0150	22	CLUB	61.1	39	9.0	65.6 -2	36.3	0.30 +2	85.5	7.7	50.8
*0015	TRES	30	CLUB	60.0	30	8.5	70.9	37.4	0.37	87.8	7.1	48.6
*0016	HYAK-TRES MIX	36	CLUB	59.8	34	8.6	67.3	37.5	0.33	85.8	7.0	50.6

* = standard mill used = Quad

mean nursery flour protein = 7.9

Standard Mean
Nursery Mean
Nursery Standard deviation

CLUB	59.9	32	8.6	69.1	37.5	0.35	86.8	7.1	49.6
CLUB	59.6	37	9.4	67.1	35.5	0.37	83.3	7.9	50.9
CLUB	1.63	6.5	1.03	1.45	2.12	0.035	2.72	0.91	1.02

SAMPLE#	BREEDER#	MTYPE	CODI	TGS
0001	1	3L	9.14	8
0002	2	2L	9.11	8
0003	4	2M	9.20	8
0004	5	2M	9.05	7
0005	7	1L	8.90	7
0006	9	2M	8.91	8
0007	10	3L	9.24	8
0008	11	3L	8.85	7
0009	12	2M	9.18	8
0010	13	3L	8.91	7
0011	14	3L	9.12	8
0012	17	1L	9.21	8
0013	18	2L	9.27	8
0014	22	1L	9.25	7
*0015	30	1L	9.23	8
*0016	36	1L	9.29	8

* = standard mean nursery flour protein = 7.9 mill used = Quad

CLUB 9.26 8
 CLUB 9.12 8
 CLUB 0.148 0.5

COMMENTS: Quality parameters of Club selections in this nursery were graded by comparison to the standard mean of Tres and Hyak-Tres mix. Breeder number II had a NIR wheat hardness value greater than 50 and would be classified as a hard wheat.

SAMPLE#	BREEDER#	MTYPE	CODI	TGS	CAVOL	SCSCOR
0001	3	3L	8.64	6	1275 -	74
0002	6	2M	8.80	6	1270 -	72
0003	8	1L	8.95	7	1315	74
0004	15	1L	8.76	7	1365	80
0005	16	2L	8.93	7	1285 -	74
0006	19	2L	8.95	8	1325	79
0007	20	3L	8.76	7	1305	78
0008	21	4L	8.61 -	7	1265 -	74
0009	23	2M	9.11	7	1245 -2	73
0010	24	1L	8.99	7	1250 -2	71
0011	25	4L	9.00	7	1335	76
*0012	26	1M	8.90	7	1345	79
0013	27	4L	8.61 -	6	1260 -	73
0014	28					
0015	29					
*0016	30	2L	8.89	7	1325	73
0017	31	3L	8.93	8	1295	75
0018	32	2L	8.88	8	1335	77
0019	33	3L	9.14	7	1375	79
0020	34	1L	8.88	7	1260 -	72
0021	35	3L	9.29 +	8	1285 -	75

* = standard mean nursery flour protein = 7.6 mill used = Buhler

CLUB	8.89	7	1335	76
CLUB	8.89	7	1299	75
CLUB	0.180	0.6	39.5	2.8
CLUB	8.89	7	1335	76
SRW	9.00	7	1335	76
SRW				

COMMENTS: Quality parameters of CLUB selections in this nursery were graded by comparison to the standard mean of Omar and Tres. Selection OR855 and Stephens were not processed for quality in this nursery due to having other appropriate check varieties. Breeder #25 was classified as SRW due to its red seed coat, even though it undoubtedly was a CLUB type.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0001	F2095 #17		SWW	60.2	31	9.6	67.7	12.9	0.33	76.5 -	8.6	55.7
0002	FW84113 F6002		SWW	60.7	37	8.1	68.7	12.3	0.35	79.0	7.4	55.5
0003	FW80070 F6011		SWW	60.3	43	10.3 -	67.2 -	12.5	0.31 +	77.2 -	8.6	56.4
0004	FW80070 F6013		SWW	62.4 +	35	10.8 -	68.1	12.4	0.33	78.2	8.7	57.5
0005	FW80070 F6003		SWW	62.5 +	39	10.3 -	68.1	12.6	0.35	74.1 -2	8.5	56.9
*0006	W301		SWW	60.4	35	8.7	68.3	13.0	0.33	79.6	7.6	56.5
0007	R90-1023 HS010		SWW	60.4	39	8.8	67.7	12.9	0.32	74.9 -2	7.5	55.4

* = standard mean nursery flour protein = 8.1 mill used = Buhler

Standard Mean	SWW	60.4	35	8.7	68.3	13.0	0.33	79.6	7.6	56.5
Nursery Mean	SWW	61.0	37	9.5	68.0	12.7	0.33	77.1	8.1	56.3
Nursery Standard deviation	SWW	1.01	3.8	1.01	0.50	0.27	0.015	2.05	0.59	0.78

SAMPLE#	BREEDER#	MTYPE	CODI	TGS	CAVOL	SCSCOR	RVA	COLOR*
0001		3M	8.46 -	6	1100 -2	63 -	183	S
0002		3L	8.38 -	5 -	1150 -	65	167	S
0003		3M	8.38 -	5 -	1060 -2	58 -2	199	S
0004		2M	8.48 -	6	1235	69	181	S
0005		2M	8.70	7	1185 -	65	130	S
*0006		2L	8.84	7	1230	70	169	S
0007		3M	8.43 -	6	1090 -2	60 -	214	S

* = standard mean nursery flour protein = 8.1 mill used = Buhler

SWW	8.84	7	1230	70	169
SWW	8.52	6	1150	64	178
SWW	0.177	0.8	69.6	4.4	26.7

COMMENTS: Quality parameters of SWW selections in this nursery were graded by comparison to the standard mean of W301, which was used as the check variety. All selections were evaluated for cookie and sponge cake quality. Rapid Visco Analyzer (RVA) viscosity was determined on all lines. RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable.

All lines were scored for alkaline flour color (COLOR). *Color represents an extremely important quality criterion in Asian types of noodles. A preliminary alkaline flour color test was initiated. An alkaline Pekar slick was used to subjectively measure flour color. The Pekar slick was prepared by pressing flour to a smooth surface, immersing in a 1.0% alkaline solution consisting of 60% K₂CO₃ and 40% Na₂CO₃ for 2 minutes. The sample rested at a room temperature of (77°F) for 4 hours before visual observation and scoring. Flours were scored by the following; S = satisfactory, Q = questionable, and U = unsatisfactory. Desirable flour color ranges from bright white through creamy yellow to bright yellow. Any dullness, brown, or greenish casts would be unacceptable. Alkaline flour color (COLOR) is scored only on SWW, HWW, SWS and HWS wheats which have a minimum RVA viscosity of 150 and a minimum NIR wheat hardness (UWHRD) value of 40.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0001	OR855		CLUB	61.4	36	13.0	67.2 +	32.8	0.36	83.8	10.8	54.3 +
*0002	HYAK		CLUB	60.2	43	14.0	66.0	32.8	0.36	82.2	11.7	58.9
*0003	HILL-81		SWW	60.7	38	12.6	68.4	34.8	0.39	83.4	10.8	59.1
0004	FW81422-S4008		SWW	59.6	34	12.2	62.2 -2	33.5	0.35 +	78.0 -2	10.2	58.6
0005	STEPHENS		SWW	61.1	29	13.4	63.9 -2	31.4	0.37	78.9 -2	11.2	59.2

* = standard mean nursery flour protein = 10.9 mill used = Quad

Standard Mean			CLUB	60.2	43	14.0	66.0	32.8	0.36	82.2	11.7	58.9
Nursery Mean			CLUB	60.8	40	13.5	66.6	32.8	0.36	83.0	11.2	56.6
Nursery Standard deviation			CLUB	0.85	4.9	0.71	0.85	0.00	0.000	1.13	0.64	3.25
Standard Mean			SWW	60.7	38	12.6	68.4	34.8	0.39	83.4	10.8	59.1
Nursery Mean			SWW	60.5	34	12.7	64.8	33.2	0.37	80.1	10.7	59.0
Nursery Standard deviation			SWW	0.78	4.5	0.61	3.20	1.72	0.020	2.89	0.50	0.32

SAMPLE#	BREEDER#	MTYPE	CODI	TGS	RVA
0001		1M	9.06 +	8	193
*0002		2M	8.65	7	200
*0003		2M	9.20	8	137
0004		2M	8.60 -2	7	189
0005		1M	8.35 -2	6 -	167

* = standard mean nursery flour protein = 10.9 mill used = Quad

CLUB			8.65	7	200
CLUB			8.86	8	196
CLUB			0.290	0.7	4.9
SWW			9.20	8	137
SWW			8.72	7	164
SWW			0.437	1.0	26.1

COMMENTS: Quality parameters of CLUB selections were graded by comparison to the standard mean of Hyak. Quality parameters of SWW selections were graded by comparison to the standard mean of Hill 81. Rapid Visco Analyzer (RVA) viscosity was determined on all lines. RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable.

Alkaline flour color (COLOR) was not scored on any of these selections for one or a combination of the following reasons: 1) flour color is not being scored on any CLUB selections or varieties; 2) NIR wheat hardness value was less than 40; or 3) the RVA viscosity was less than 150.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0001	FW81422-S4008 FW81422-S4008 OR855 STEPHENS O-LINES		SHW	53.8	9	10.9 +	60.6	40.2	0.37 +	74.7 +	8.3 +	51.1
0002			SHW	50.9	17	12.7	57.5 -2	40.9	0.35 +2	72.0	10.1	52.4
0003			CLUB	51.8	21	12.4	61.8 +	38.6	0.41	73.7 +	10.1	53.3
*0004			SHW	52.2	11	12.8	59.8	39.0	0.41	71.1	10.1	52.8
0005			SHW	53.9 +	14	11.9	61.1 +	38.5	0.39 +	74.1 +	9.8	55.1
0006	N-LINES H-LINES P-LINES M-LINES L-LINES		SHW	52.2	9	11.7	58.0 -	36.4	0.39 +	70.1	9.3	55.6 -
0007			SHW	53.1	11	12.5	63.9 +2	34.5	0.41	76.4 +2	10.3	55.4
0008			SHW	50.5 -	17	14.2	55.2 -2	32.8	0.46 -2	62.1 -2	11.2	57.9 -
0009			HWW	51.8	66	13.6	59.6	25.9	0.44 -	71.6	11.8 -	61.2 -2
0010			HWW	52.1	55	14.3	61.0 +	28.3	0.38 +	76.2 +2	12.3 -	59.0 -2
0011	F-LINES A-LINES ORFWHS002 "G" ORFWB0004 ORFWHS004		SHW	51.7	21	13.3	61.8 +	32.9	0.43 -	72.4	10.7	58.0 -
0012			SHW	52.9	16	12.4	57.4 -2	35.9	0.43 -	66.8 -2	9.7	57.3 -
0013			SHW	53.1	12	11.3	62.8 +2	38.8	0.40	75.6 +2	9.3	56.1 -
0014			SHW	53.9 +	13	12.6	67.1 +2	37.7	0.34 +2	84.9 +2	10.1	56.0 -
0015			SHW	52.8	15	13.4	62.4 +2	33.2	0.43 -	73.2	11.3	56.2 -
0016	91		SHW	52.2	5	11.9	65.3 +2	38.6	0.35 +2	82.0 +2	9.9	54.6
0017			SHW	49.9 -	6	13.2	63.3 +2	40.2	0.39 +	76.9 +2	10.1	54.3
0018			SHW	50.1 -	15	11.8	64.0 +2	40.0	0.39 +	77.8 +2	9.5	53.9
0019			SHW	55.1 +	3	12.4	61.6 +	34.8	0.40	74.1 +	10.3	55.0
0020			SHW	54.1 +	13	12.2	64.3 +2	36.4	0.33 +2	82.0 +2	10.0	53.8
0021	96		SHW	55.4 +	46	13.3	61.6 +	30.2	0.39 +	74.7 +	11.5	55.4
0022			SHW	53.9 +	19	11.9	63.7 +2	35.1	0.35 +2	79.9 +2	9.7	52.3
0023			SHW	56.8 +2	26	12.2	66.4 +2	37.2	0.35 +2	83.4 +2	9.9	53.4
0024			SHW	55.0 +	15	11.2 +	67.2 +2	39.6	0.33 +2	85.7 +2	9.4	53.4
0025			SHW	52.6	28	12.4	63.9 +2	35.7	0.38 +	78.3 +2	10.1	53.4
0026	101		SHW	52.1	20	11.7	65.9 +2	38.6	0.29 +2	86.6 +2	9.5	50.4
0027			SHW	49.1 -	6	12.9	63.3 +2	41.8	0.42	75.0 +	10.1	51.3
0028			SHW	56.5 +2	16	11.8	62.4 +2	37.2	0.35 +2	78.3 +2	9.6	50.4
0029			SHW	53.2	16	13.0	63.7 +2	38.2	0.40	76.8 +2	10.3	51.4
0030			SHW	56.7 +2	18	11.5	65.6 +2	38.8	0.33 +2	83.6 +2	9.4	50.3
0031	106		SHW	53.0	12	12.2	62.2 +2	36.7	0.35 +2	78.0 +2	10.0	51.8
0032			HWW	56.1 +2	59	13.3	59.4	29.1	0.40	73.5 +	12.3 -	56.9 -
0033			SHW	53.9 +	19	11.6	62.7 +2	39.4	0.39 +	76.1 +2	9.6	52.4
0034			SHW	54.5 +	6	11.2 +	63.7 +2	37.8	0.34 +2	80.6 +2	8.8	50.8
0035			SHW	51.6	9	12.1	63.5 +2	39.0	0.35 +2	79.7 +2	10.0	51.4
0036	111		SHW	52.5	14	13.1	60.2	34.7	0.42	71.0	10.6	50.6
0037			SHW	52.2	4	12.0	64.1 +2	38.2	0.39 +	77.9 +2	10.1	51.6
0038			SHW	56.4 +2	9	12.2	63.2 +2	37.2	0.35 +2	79.3 +2	9.8	51.6
0039			SHW	52.0	7	11.4	62.6 +2	40.7	0.33 +2	79.8 +2	8.6 +	51.7
0040			SHW	53.2	9	10.2 +	62.2 +2	36.1	0.36 +2	77.4 +2	8.4 +	51.6

* = standard mean nursery flour protein = 9.9 mill used = quad

SAMPLE#	BREEDER#	MTYPE	CODI	TGS	RVA	COLOR*
0001		3L	8.82 -2	5	154	
0002		2M	8.75 -2	5	174	
0003		2M	9.60 +	8 +	158	
*0004		2M	9.34	6	175	
0005		4M	8.86 -	6	96	
0006		4M	8.65 -2	6	78	
0007		2M	8.91 -	7	114	
0008		4M	8.15 -2	4 -	100	
0009		2H	8.45 -2	4 -	107	Q
0010		1H	8.32 -2	4 -	116	S
0011		2M	8.95 -	7	105	
0012		4M	8.74 -2	6	67	
0013		3M	9.14	8 +	114	
0014		4L	9.36	7	96	
0015		2M	8.94 -	7	104	
0016		2M	9.21	7	97	
0017		2M	9.23	7	63	
0018		2M	8.96 -	7	112	
0019		3M	9.46	7	124	
0020		2M	9.25	8 +	117	
0021		2H	8.40 -2	6	163	U
0022		2M	9.19	8 +	127	
0023		2M	9.60 +	8 +	124	
0024		3L	9.27	8 +	126	
0025		2M	9.41	8 +	138	
0026		3L	9.18	8 +	127	
0027		2M	9.35	7	66	
0028		2M	9.57	9 +2	129	
0029		1M	9.11	8 +	142	
0030		2M	9.12	8 +	170	
0031		2M	9.25	8 +	102	
0032		2H	8.38 -2	3 -2	202	Q
0033		2M	9.10	6	126	
0034		2M	9.25	8 +	98	
0035		1M	9.64 +	8 +	122	
0036		2H	8.91 -	6	102	
0037		1M	9.27	8 +	143	
0038		2M	9.04 -	7	107	
0039		3L	9.57	8 +	108	
0040		2M	9.01 -	7	160	

* = standard mean nursery flour protein = 9.9 mill used = Quad

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0041	116		SWW	54.4 +	15	11.8	61.8 +	39.0	0.32 +2	79.4 +2	9.2	52.3
0042	117		SWW	54.0 +	12	12.0	63.9 +2	34.5	0.36 +2	79.6 +2	10.2	52.3
0043	118		SWW	52.6	6	12.4	61.6 +	35.6	0.37 +	76.0 +2	9.9	52.4
0044	119		SWW	54.2 +	19	12.1	64.4 +2	35.6	0.34 +2	81.5 +2	9.8	52.4
0045	120		SWW	54.5 +	2	11.1 +	61.2 +	39.6	0.33 +2	78.0 +2	8.8	53.6
0046	121		SWW	51.0	4	12.1	61.0 +	37.8	0.38 +	74.6 +	10.0	53.5
0047	122		SWW	53.1	15	13.1	64.3 +2	39.0	0.36 +2	80.1 +2	11.2	54.6
0048	123		SWW	54.0 +	2	13.3	62.4 +2	35.6	0.40	75.1 +	10.3	53.8
0049	124		SWW	53.7	7	12.3	63.5 +2	37.3	0.32 +2	81.6 +2	9.9	54.9
0050	125		SWW	53.4	20	12.4	62.5 +2	36.7	0.33 +2	79.7 +2	9.5	52.4
0051	126		SWW	54.3 +	13	12.1	59.8	36.5	0.40	71.8	9.9	52.8
0052	127		SWW	56.1 +2	13	11.8	64.3 +2	37.8	0.33 +2	82.0 +2	9.2	52.5
0053	128		SWW	52.3	4	11.0 +	63.5 +2	43.8	0.35 +2	79.7 +2	9.1	52.5
0054	129		SWW	54.2 +	18	11.4	63.2 +2	35.2	0.36 +2	78.7 +2	9.2	51.5
0055	130		SWW	56.2 +2	15	12.7	62.7 +2	32.5	0.33 +2	79.9 +2	10.3	50.4
0056	131		SWW	52.3	17	12.5	62.8 +2	37.6	0.35 +2	78.8 +2	10.0	51.5
0057	132		SWW	55.1 +	18	12.0	63.6 +2	36.4	0.34 +2	80.4 +2	9.6	51.3
0058	133		SWW	54.9 +	9	12.3	62.4 +2	36.4	0.37 +	77.0 +2	9.9	51.9
0059	134		SWW	55.9 +2	12	11.3	64.4 +2	38.0	0.37 +	79.6 +2	9.0	50.5
0060	135		SWW	54.0 +	7	12.1	64.4 +2	38.4	0.40	77.6 +2	9.7	51.6

* = standard mean nursery flour protein = 9.9 mill used = Quad

Standard Mean	SWW	52.2	11	12.8	59.8	39.0	0.41	71.1	10.1	52.8
Nursery Mean	SWW	53.4	13	12.2	62.7	37.3	0.37	77.5	9.8	53.0
Nursery Standard deviation	SWW	1.75	7.4	0.74	2.28	2.48	0.035	4.50	0.66	1.98
Standard Mean	SWW	52.2	11	12.8	59.8	39.0	0.41	71.1	10.1	52.8
Nursery Mean	CLUB	51.8	21	12.4	61.8	38.6	0.41	73.7	10.1	53.3
Nursery Standard deviation	CLUB									
Standard Mean	SWW	52.2	11	12.8	59.8	39.0	0.41	71.1	10.1	52.8
Nursery Mean	HWW	53.3	60	13.7	60.0	27.8	0.41	73.8	12.1	59.0
Nursery Standard deviation	HWW	2.40	5.6	0.51	0.87	1.67	0.031	2.31	0.29	2.15

SAMPLE#	BREEDER#	MTYPE	COOI	TGS	RVA	COLOR*
0041		4M	8.94 -	7	115	
0042		2M	9.38	8 +	122	
0043		2M	8.80 -2	7	101	
0044		2M	9.24	8 +	115	
0045		3M	9.20	8 +	146	
0046		3M	8.74 -2	7	114	
0047		2M	9.02 -	7	115	
0048		2M	8.79 -2	7	101	
0049		4M	9.09	7	117	
0050		2M	8.66 -2	5	104	
0051		1M	8.96 -	5	131	
0052		2M	9.11	8 +	131	
0053		2M	9.16	8 +	64	
0054		2M	9.29	7	136	
0055		1H	8.85 -	8 +	169	
0056		1M	8.95 -	7	102	
0057		2M	8.96 -	8 +	120	
0058		2H	9.05 -	7	113	
0059		2M	9.09	8 +	157	
0060		3M	9.18	8 +	154	

* = standard mean nursery flour protein = 9.9 mill used = Quad

SWW	9.34	6	175
SWW	9.08	7	120
SWW	0.286	1.0	27.1

SWW	9.34	6	175
CLUB	9.60	8	158

SWW	9.34	6	175
HWW	8.38	4	142
HWW	0.065	0.6	52.4

COMMENTS: Quality parameters of SWW selections in this nursery were graded by comparison to the standard mean of Stephens. Sample #'s 920009, 920010 and 920032 had NIR wheat hardness value greater than 50 and were classified as HWW. All selections had low test weight (Nursery mean for SWW-53.4 lbs/bu), apparently due to weathering. This contributed to most lines having low flour yield and/or milling score. Nearly all lines had flour yield and/or milling score equal to or significantly higher than that of Stephens. Several lines had low flour ash content compared to Stephens and this also contributed to higher milling scores. Cookies were baked on all lines. Several lines had cookie diameter comparable to Stephens, however, several had cookie diameter significantly less than that of Stephens. Sample #'s 920003 (OR855), 920023 and 920035 had exceptionally good cookie diameter and top grain score. Rapid Visco Analyzer (RVA) viscosity was determined on all lines. RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable. Alkaline flour color (COLOR) was scored on lines classified as HWW and on SWW lines having NIR wheat hardness value greater than 40. *Color represents an extremely important quality criterion in Asian types of noodles. A preliminary alkaline flour color test was initiated. An alkaline Pekar slick was used to subjectively measure flour color. The Pekar slick was prepared by pressing flour to a smooth surface, immersing in a 1.0% alkaline solution consisting of 60% K₂CO₃ and 40% Na₂CO₃ for 2 minutes. The sample rested at a room temperature of (77°F) for 4 hours before visual observation and scoring. Flours were scored by the following; S = satisfactory, Q = questionable, and U = unsatisfactory. Desirable flour color ranges from bright white through creamy yellow to bright yellow. Any dullness, brown, or greenish casts would be unacceptable. Alkaline flour color (COLOR) is scored only on SWW, HWW, SWS and HWS wheats which have a minimum RVA viscosity of 150 and a minimum NIR wheat hardness (UWHRD) value of 40.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
*0001	MADSEN	1	SWW	56.3	21	10.7	73.6	50.3	0.42	88.1	9.3	54.1
*0002	MADSEN	2	SWW	56.4	16	10.3	74.1	51.4	0.43	88.1	8.7	53.0
0003	FW 301	3	SWW	55.5	19	9.5	73.6	50.1	0.44	86.8	8.4	51.5
0004	FW 301	4	SWW	56.0	15	9.6	73.4	50.0	0.43	87.2	8.1	50.4 +
0005	FW81422-S4008	5	SWW	55.9	14	8.9 +	71.1 -2	51.4	0.40 +	86.2	6.9 +	51.1
0006	FW81422-S4008	6	SWW	55.7	12	8.8 +	70.6 -2	51.7	0.41	84.9 -	6.7 +	51.1
0007	MACVICAR	11	SWW	54.8	5	8.5 +	70.9 -2	49.9	0.40 +	85.9 -	6.8 +	51.0
0008	MACVICAR	12	SWW	54.6 -	8	8.5 +	71.7 -	50.4	0.40 +	86.9	7.1 +	51.1

* = standard mean nursery flour protein = 7.8 mill used = Quad

Standard Mean	SWW	56.3	18	10.5	73.8	50.8	0.42	88.1	9.0	53.5
Nursery Mean	SWW	55.7	14	9.4	72.4	50.6	0.42	86.8	7.8	51.7
Nursery Standard deviation	SWW	0.66	5.3	0.82	1.44	0.73	0.016	1.09	1.00	1.24

SAMPLE#	BREEDER#	MTYPE	CODI	TGS	RVA
*0001	1	2M	8.88	8	102
*0002	2	2M	9.15	8	110
0003	3	2M	8.85	7	112
0004	4	2M	8.90	8	117
0005	5	1L	8.55 -	7	128
0006	6	1L	8.59 -	6 -	141
0007	11	1L	8.66 -	7	114
0008	12	1L	8.94	8	111

* = standard mean nursery flour protein = 7.8 mill used = Quad

SWW	9.02	8	106
SWW	8.82	7	117
SWW	0.202	0.7	12.2

COMMENTS: This nursery consisted of paired varieties and selections which were treated and untreated. The treatment was a Russian Wheat Aphid (RWA) 338 treatment. No information was given to identify which one of the pair was treated or untreated. This treatment appeared to have insignificant effect on quality parameters. Quality parameters of SWW selections in this nursery were graded by comparison to the standard mean of Madsen (treated and untreated). Test weight of all selections was rather poor, apparently due to weathering. Breeder #'s 5, 6, 11 and 12 had flour yield significantly less than that of Madsen. All selections except Breeder #'s 6 and 11 had milling score fairly comparable to that of Madsen. All lines had comparable cookie diameter to that of the standard mean, except for Breeder #'s 5, 6 and 11 which were significantly smaller.

Rapid Visco Analyzer (RVA) viscosity was determined on all selections. RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0001	STEPHENS	1-1	SWW	53.2	30	13.9	60.8	33.7	0.44	70.5	11.6	58.8
*0002	MACVICAR	1-5	SWW	53.6	26	13.7	62.5	32.8	0.44	72.7	11.4	58.4
0003	FW301	1-6	SWW	54.3	27	14.0	63.3	32.8	0.43	74.3	11.7	58.4
0004	OR855	1-9	CLUB	54.5	25	13.7	62.6	34.3	0.46	71.5	11.5	57.4
0005	FW81422-S4008	1-17	SWW	53.8	32	13.3	58.9	35.6	0.43	68.7	10.8	56.6

* = standard mean nursery flour protein = 11.4 mill used = Quad

Standard Mean	SWW	53.6	26	13.7	62.5	32.8	0.44	72.7	11.4	58.4
Nursery Mean	SWW	53.7	29	13.7	61.4	33.7	0.43	71.6	11.4	58.0
Nursery Standard deviation	SWW	0.46	2.8	0.31	1.95	1.32	0.006	2.46	0.40	0.98
Standard Mean	SWW	53.6	26	13.7	62.5	32.8	0.44	72.7	11.4	58.4
Nursery Mean	CLUB	54.5	25	13.7	62.6	34.3	0.46	71.5	11.5	57.4
Nursery Standard deviation	CLUB									

SAMPLE#	BREEDER#	MTYPE	CODI	TGS	RVA
0001	1-1	2M	8.64	6	114
*0002	1-5	2M	8.90	7	168
0003	1-6	2M	9.09	7	95
0004	1-9	2M	8.96	7	128
0005	1-17	2M	8.54	5	213

* = standard mean nursery flour protein = 11.4 mill used = Quad

SWW	8.90	7	168
SWW	8.79	6	148
SWW	0.250	1.0	53.5
SWW	8.90	7	168
CLUB	8.96	7	128
CLUB			

COMMENTS: Quality parameters of CLUB and SWW selections in this nursery were graded by comparison to the standard mean of Macvivar. The nursery mean test weight of all lines was quite low and this contributed to poor flour yield, elevated flour ash and poor milling score. Rapid Visco analyzer (RVA) viscosity was determined on all lines. RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable.

Alkaline flour color was not scored on any of these lines since all had NIR wheat hardness values (UWHRD) less than 40.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0001	RR68 I	3281 2	HRS	60.6	57	14.4	63.7	30.5	0.34 -	81.2	13.2 +	70.5 +2
0002	RR68 I	3281 3	HRS	60.8	64	14.0	63.9	26.8	0.34 -	81.4	13.1 +	69.8 +2
0003	RR68 II	3282 2	HRS	59.5	51	13.3	67.8 +2	31.1	0.34 -	85.4 +	12.1	65.9 +
0004	RR68 II	3282 3	HRS	59.9	51	13.3	68.0 +2	30.7	0.31	87.2 +2	12.0	65.9 +
0005	KLASIC	3283 2	HWS	57.0 -	27	13.3	65.7 +	33.1	0.33 -	83.8	11.9	62.6
0006	KLASIC	3283 3	HWS	57.1 -	22	13.4	65.1 +	32.6	0.32	83.7	12.0	62.5
*0007	MCKAY	3284 2	HRS	60.0	62	13.1	64.5	30.3	0.30	84.1	11.3	61.7
*0008	MCKAY	3284 3	HRS	60.0	61	13.3	63.1	30.1	0.32	81.6	11.9	63.0
* = standard mean nursery flour protein = 12.2 mill used = Quad												
Standard Mean												
Nursery Mean												
Nursery Standard deviation												
Standard Mean												
Nursery Mean												
Nursery Standard deviation												

SAMPLE#	BREEDER#	MTYPE	BABS	MTIME	LVOL	BCRGR	PROQ	RVA
0001	3281 2	7H	71.2 +2	12.0 +2	900 -2	4	-1	250
0002	3281 3	7H	70.0 +2	9.8 +2	910 -2	4	-1	238
0003	3282 2	6H	63.1	9.5 +2	840 -2	4	-1	222
0004	3282 3	6H	64.6	11.6 +2	1025	4	+1	204
0005	3283 2	7H	62.3	7.3 +	970	4	+1	250
0006	3283 3	6H	61.7	7.1 +	1005	4	+1	248
*0007	3284 2	4H	63.4	5.6	985	2	+1	69
*0008	3284 3	5H	62.7	5.7	1010	3	+1	100
* = standard mean nursery flour protein = 12.2 mill used = Quad								
HRS			63.0	5.7	998	2		84
HRS			65.8	9.0	945	4		180
HRS			3.77	2.80	72.8	0.8		76.6
HRS			63.0	5.7	998	2		84
HWS			62.0	7.2	988	4		248
HWS			0.42	0.14	24.7	0.0		

COMMENTS: Quality parameters of the Red River Biotypes were graded by comparison to the standard mean of McKay. Bread was baked on all lines. Due to the length of mixing time and some water absorption problems, some difficulties were encountered in the baking time schedule. Those samples with sufficient flour were replicated. Where replication was not good, data is questionable (particularly sample #920003 (RR68II) and 920004 (RR68II)). Rapid Visco Analyzer (RVA) viscosity was determined on all lines except sample #920005 which had insufficient flour for RVA analysis. RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UMHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0001		1	HRS	59.7	27	14.8	62.5	35.8	0.38	77.8	12.2	57.0
0002		2	HRS	59.5	34	15.7	64.2	36.1	0.38	79.6	12.9	58.0
0003		3	HRS	59.7	35	15.3	65.4	29.9	0.38	80.8	12.7	58.3
0004		4	HRS	60.1	37	15.6	65.6	37.4	0.39	80.5	13.4	59.3
0005		5	HRS	59.2	36	15.6	63.4	35.8	0.38	78.8	13.5	59.3
0006		6	HRS	60.7	30	14.1	63.0	38.4	0.33	80.9	12.1	54.3
0007		7	HRS	60.0	33	14.7	61.7	36.8	0.32	80.1	12.0	54.2
0008		8	HRS	60.0	51	14.4	66.1	37.8	0.36	82.6	12.5	56.9
0009		9	HRS	60.7	51	15.2	65.4	37.9	0.35	82.4	13.2	58.5
0010		10	HRS	59.6	30	14.9	62.2	36.2	0.33	80.1	12.7	58.3
0011		11	HRS	60.3	40	14.9	61.9	36.5	0.31	80.8	12.6	55.2
0012		12	HRS	59.2	26	15.8	61.8	36.8	0.34	79.2	13.4	58.8
0013		13	HRS	60.9	36	14.8	63.3	37.4	0.33	81.3	12.5	54.8
0014		14	HRS	58.6	40	16.0	59.2	33.2	0.34	76.5	13.5	57.0
0015		15	HRS	58.8	29	15.6	59.4	33.4	0.33	77.2	13.1	57.1
0016		16	HRS	58.1	20	15.2	59.5	34.8	0.34	76.8	13.4	59.1
0017		17	HRS	61.3	21	14.6	61.4	36.5	0.31	80.3	12.1	52.4
0018		18	HRS	61.5	36	14.3	62.7	37.1	0.30	82.2	12.1	52.2
0019		19	HRS	59.1	25	15.5	61.8	35.4	0.34	79.2	12.8	52.1
0020		20	HRS	60.3	41	15.7	62.3	35.4	0.33	80.2	13.3	54.8
0021		21	HRS	60.2	30	14.8	61.6	35.5	0.33	79.5	12.6	52.2
0022		22	HRS	60.7	29	14.4	61.6	35.4	0.31	80.5	12.3	53.0
0023		23	HRS	59.2	18	14.8	58.1	34.1	0.33	75.8	12.5	53.3
0024		24	HRS	59.3	26	15.7	59.0	34.8	0.32	77.3	13.1	54.0
0025		25	HRS	60.5	43	15.8	62.4	36.4	0.32	80.8	12.3	53.0
0026		26	HRS	56.3	31	15.4	63.7	39.5	0.34	81.2	13.6	56.2
0027		27	HRS	57.9	33	14.7	63.8	38.6	0.37	79.7	13.1	56.1
0028		28	HRS	54.8	48	15.4	61.4	35.3	0.39	76.1	13.3	55.2
0029		29	HRS	55.7	33	15.3	61.3	35.0	0.37	77.1	13.3	55.1
0030		30	HRS	59.7	48	15.6	65.1	37.6	0.36	81.6	13.8	55.2
0031		31	HRS	59.4	39	13.9	64.6	38.6	0.36	81.1	12.6	56.7
0032		32	HRS	57.7	40	16.2	62.1	36.6	0.38	77.4	14.0	55.1
0033		33	HRS	53.6	30	15.0	62.0	36.3	0.42	75.2	13.3	54.8
0034		34	HRS	59.9	30	15.3	59.8	35.3	0.34	77.1	12.4	54.3
0035		35	HRS	60.6	33	15.4	66.7	36.1	0.36	83.2	13.6	57.3
*0036	36/43-44	36	HRS	60.9	82	15.9	67.2	37.6	0.38	82.7	14.1	57.4
*0037	36/57-58	36	HRS	59.8	86	15.8	68.1	38.8	0.36	84.7	14.1	57.7
*0038	36/155-156	36	HRS	60.6	82	16.1	66.4	35.8	0.37	82.4	13.9	59.7
*0039	36/127-128	36	HRS	60.3	23	14.6	61.9	36.1	0.33	79.8	12.6	57.2
0040	37/R2(171-172, 157-158, 129-130, 185-186)	37	HRS	60.4	34	15.4	62.6	35.7	0.35	79.5	13.2	57.1
0041	37/R1(59-60, 31-32, 87-88)	37	HRS	60.4	34	15.4	62.6	35.7	0.35	79.5	13.2	57.1

* = standard mean nursery flour protein = 13.0 mill used = Quad

SAMPLE#	BREEDER#	MTYPE	COOI	TGS	BABS	MTIME	LVOL	BCRGR	PROQ	RVA
0001	1	2M	8.36	6	59.2	1.4	610	9	-1	207
0002	2	1H	8.20	6	60.2	1.1	660	9	-1	188
0003	3	1H	8.25	5	61.5	1.2	715	9	-1	174
0004	4	1H	8.21	4	62.5	1.3	730	9	-1	184
0005	5	1H	8.26	5	61.5	1.4	765	7	-1	205
0006	6	2M	8.64	7	56.5	1.5	600	9	-1	188
0007	7	2M	8.50	6	56.4	1.4	555	9	-1	190
0008	8	3H	8.41	5	59.1	2.4	885	4	-1	216
0009	9	2H	8.30	6	60.7	2.0	930	4	-1	202
0010	10	2M	8.39	6	60.5	1.7	755	8	-1	205
0011	11	2H	8.32	6	57.4	1.5	650	9	-1	208
0012	12	2M			61.0	1.7	690	9	-1	210
0013	13	2H	8.59	6	57.0	1.5	715	9	-1	214
0014	14	2M	7.91	6	59.2	1.7	665	9	-1	
0015	15	2M	8.35	6	59.3	1.7	665	9	-1	194
0016	16	2M	8.66	6	61.3	1.3	740	8	-1	203
0017	17	1H	8.89	8	54.6	1.7	590	9	-1	186
0018	18	1H	8.57	5	54.4	1.4	580	9	-1	188
0019	19	1H	8.64	6	55.3	1.5	700	9	-1	208
0020	20	2H	8.40	3	57.0	2.2	775	7	-1	208
0021	21	2M	8.60	6	54.4	1.7	605	9	-1	214
0022	22	2M	8.56	3	56.2	1.9	650	9	-1	205
0023	23	1H	8.38	6	55.5	1.5	615	9	-1	200
0024	24									
0025	25	1H			56.2	1.7	675	9	-1	204
0026	26	2M	8.40	5	55.2	2.0	660	9	-1	208
0027	27	1H	8.60	5	58.4	1.8	930	5	-1	210
0028	28	2H	8.90	8	58.3	1.5	880	4	-1	207
0029	29	1H	8.30	6	59.4	1.1	760	8	-1	244
0030	30	1H	8.38	6	58.3	1.5	830	7	-1	230
0031	31	2H	8.26	7	58.4	2.0	930	5	-1	212
0032	32	2H	8.55	5	58.9	1.7	990	4	+1	227
0033	33	1H	8.36	6	59.3	1.3	805	8	-1	190
0034	34	1H	8.00	6	58.0	1.3	860	6	-1	249
0035	35	2M	8.45	6	56.5	1.5	630	9	-1	204
*0036	36	4H	8.21	4	59.5	2.9	950	3	-1	218
*0037	36	3H	8.04	4	59.6	2.5	1005	2	-1	216
*0038	36	4H	7.95	6	60.9	3.2	1040	2	0	215
*0039	36	4H	8.10	5	62.9	2.9	1040	3	0	211
0040	37	2M	8.40	6	59.4	1.7	725	9	-1	202
0041	37	2M	8.43	6	59.3	1.7	775	8	-1	198

* = standard mean nursery flour protein = 13.0 mill used = Quad

COMMENTS: There was insufficient wheat for milling for Breeder #24, however, there was sufficient wheat for NIR wheat hardness and protein content analyses. Breeder #'s 12 and 25 had insufficient flour for a cookie bake.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	NABS
0001			HRS	58.9	42	15.4	64.2	37.2	0.40	78.5	13.2	55.3
0002			HRS	58.2	35	15.9	62.8	36.7	0.41	76.6	13.7	55.1
0003			HRS	58.6	32	15.2	64.9	36.4	0.40	79.3	13.0	55.1
0004			HRS	58.9	29	15.8	63.9	36.3	0.41	77.7	13.8	55.0
0005			HRS	58.9	29	15.4	63.3	36.7	0.42	76.6	13.3	54.1
0006			HRS	58.8	26	15.6	65.5	37.8	0.44	77.8	13.5	53.9
0007			HRS	58.5	30	15.5	64.7	37.5	0.40	79.1	13.3	52.9
0008			HRS	58.3	32	15.5	63.8	35.0	0.39	78.6	13.3	52.8
0009			HRS	59.6	33	15.5	64.5	37.2	0.44	76.8	13.1	54.5
0010			HRS	59.4	32	15.1	64.5	37.9	0.41	78.3	12.6	52.1
0011			HRS	58.6	31	15.2	65.6	39.6	0.39	80.5	13.0	53.0
0012			HRS	58.1	27	15.6	63.2	36.8	0.40	77.5	12.9	52.1
0013			HRS	58.9	32	15.4	64.2	36.8	0.40	78.5	13.1	52.1
0014			HRS	59.6	25	15.3	65.8	38.2	0.38	81.3	13.1	51.5
0015			HRS	59.6	31	15.0	66.1	29.4	0.38	81.6	12.9	53.0
0016			HRS	57.4	27	15.4	63.7	29.1	0.38	79.1	13.2	52.6
0017	17 /166-167		HRS	57.5	29	17.1	61.4	39.8	0.41	75.1	14.6	52.5
0018	17 /964-965		HRS	58.3	27	15.1	64.8	28.3	0.44	77.1	13.0	53.0
0019	18 /889-890		HRS	56.6	33	17.8	59.7	0.0	0.46	70.7	15.0	53.3
0020	18 /979-980		HRS	59.6	28	15.5	66.7	38.9	0.41	80.6	13.4	55.4
0021			HRS	58.4	29	16.0	64.0	37.2	0.42	77.3	13.9	55.1
0022	20 /7-8		HRS	58.4	30	15.7	63.3	36.3	0.42	76.6	13.8	55.4
0023	20 /382-383		HRS	58.3	31	15.9	63.0	36.4	0.43	76.6	13.9	55.8
0024			HRS	59.4	35	16.2	64.5	37.1	0.43	77.3	13.9	51.7
0025			HRS	58.2	34	14.7	64.8	38.6	0.40	79.2	12.7	56.4
0026			HRS	58.4	34	16.2	62.8	35.6	0.40	77.1	13.9	51.9
0027			HRS	58.0	28	15.7	63.0	35.7	0.40	77.3	13.6	53.0
0028			HRS	58.6	28	15.1	64.6	37.6	0.41	78.4	12.9	53.0
0029			HRS	58.9	32	15.4	66.2	38.4	0.42	79.6	13.2	53.1
0030			HRS	58.5	27	15.8	65.3	37.9	0.44	77.6	13.5	54.1
0031			HRS	59.4	30	15.0	67.0	39.6	0.42	80.4	13.0	54.0
0032	28 /10-11		HRS	59.0	26	15.3	65.9	39.8	0.43	78.8	13.3	54.9
0033	28 /859-860		HRS	58.8	40	16.0	66.7	40.0	0.44	79.1	13.9	54.0
0034			HRS	57.2	35	16.9	63.3	35.8	0.45	75.0	14.4	54.9
0035			HRS	58.3	34	15.5	65.0	37.4	0.43	77.8	13.3	54.0
0036			HRS	59.1	20	15.4	65.9	37.6	0.41	79.8	13.1	54.1
0037			HRS	58.4	32	16.6	62.0	34.6	0.43	74.7	13.8	52.3
0038			HRS	58.2	29	15.9	63.4	35.8	0.42	76.7	13.5	53.0
0039			HRS	58.7	30	16.4	64.0	35.7	0.45	75.7	14.1	55.0
0040			HRS	58.5	34	15.8	63.9	36.1	0.43	76.7	13.6	53.0

mean nursery flour protein = 13.5 mill used = Quad

SAMPLE#	BREEDER#	MTYPE	BABS	MTIME	LVOL	BCRGR	PROQ
0001		2M	58.5	1.5	635	9	-1
0002		2M	58.3	2.2	670	9	-1
0003		2M	59.3	2.4	635	9	-1
0004		2M	57.2	2.8	650	9	-1
0005		2M	56.3	2.2	700	8	-1
0006		2M	58.1	2.5	720	9	-1
0007		1M	56.1	2.4	695	9	-1
0008		2M	58.5	1.6	665	9	-1
0009		2M	57.7	2.2	785	7	-1
0010		2M	57.3	2.0	660	9	-1
0011		1M	57.2	1.4	715	8	-1
0012		1H	56.3	2.2	635	9	-1
0013		1H	56.3	1.1	700	9	-1
0014		2M	55.7	1.5	695	9	-1
0015		2M	57.2	2.8	655	9	-1
0016		1H	56.8	1.7	705	8	-1
0017		1H	56.7	1.4	650	9	-1
0018		3M	57.2	2.4	690	9	-1
0019		1H	57.5	1.2	640	9	-1
0020		2M	59.6	2.5	710	9	-1
0021		2M	59.3	2.2	750	8	-1
0022		2M	59.6	2.2	675	9	-1
0023		2M	60.0	2.0	685	9	-1
0024		1M	55.9	1.7	685	9	-1
0025		1H	55.6	1.9	600	9	-1
0026		1H	56.1	1.8	630	9	-1
0027		1H	57.2	2.0	590	9	-1
0028		2M	57.2	2.0	715	8	-1
0029		2M	57.3	2.5	700	9	-1
0030		3M	58.3	2.3	715	8	-1
0031		2M	58.2	2.9	650	9	-1
0032		2M	59.1	2.2	725	8	-1
0033		2M	58.2	2.4	745	7	-1
0034		1H	59.1	1.4	570	9	-1
0035		2M	58.2	2.6	700	9	-1
0036		2M	58.3	2.3	700	9	-1
0037		1H	58.5	1.5	565	9	-1
0038		1H	57.2	1.9	625	9	-1
0039		2M	59.2	2.6	675	9	-1
0040		1H	57.2	1.5	670	9	-1

mean nursery flour protein = 13.5 mill used = quad

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0041	37		HRS	59.4	34	14.6	67.2	38.4	0.40	81.7	12.5	53.0
0042	38		HRS	59.5	30	14.8	66.6	38.2	0.44	79.0	12.6	54.0
0043	39		HRS	58.6	34	15.4	65.9	37.5	0.46	77.2	13.2	55.4
0044	40		HRS	57.9	27	16.1	63.6	36.0	0.43	76.3	14.0	54.9
0045	41		HRS	58.1	27	16.6	63.9	37.0	0.44	76.1	14.3	54.8
0046	42		HRS	57.8	39	15.3	65.7	37.9	0.43	78.5	13.2	53.9
0047	43		HRS	58.1	31	14.4	66.4	38.7	0.43	79.3	12.6	53.5
0048	44		HRS	58.9	25	15.8	66.3	38.1	0.41	80.2	12.7	52.0
0049	45		HRS	58.1	27	15.5	66.1	38.9	0.44	78.4	13.3	53.8
0050	46		HRS	58.7	32	16.0	65.0	37.2	0.43	77.8	13.8	53.8
0051	47		HRS	59.2	25	15.5	65.1	37.7	0.42	78.4	13.1	54.1
0052	48		HRS	58.2	36	16.4	62.8	35.8	0.42	76.0	14.1	54.9
0053	49		HRS	59.7	29	15.7	65.9	37.1	0.42	79.3	13.2	54.8
0054	50		HRS	59.7	29	15.9	65.6	36.9	0.41	79.5	13.5	55.5
0055	51		HRS	57.7	24	16.7	62.4	34.7	0.45	74.0	14.1	53.5
0056	52		HRS	58.3	38	16.0	63.2	35.7	0.40	77.5	13.6	54.0
0057	53		HRS	58.3	27	16.8	62.7	37.0	0.40	77.0	14.2	53.5
0058	54		HRS	58.8	39	15.5	64.9	38.1	0.41	78.8	13.4	53.1
0059	55		HRS	57.1	29	17.2	61.3	35.3	0.45	72.9	14.4	54.0
0060	56		HRS	57.8	29	16.2	63.5	37.7	0.41	77.3	13.4	53.1
0061	57		HRS	58.1	33	16.5	62.9	35.7	0.42	76.1	14.2	53.9
0062	58		HRS	58.8	29	15.4	65.9	38.6	0.40	80.3	13.2	52.0
0063	59		HRS	59.0	32	15.2	66.5	39.1	0.41	80.4	13.1	53.4
0064	60		HRS	58.4	32	15.4	65.4	38.2	0.42	78.8	13.4	53.4
0065	61		HRS	58.1	34	16.0	63.9	37.3	0.40	78.2	13.8	53.9
0066	62		HRS	58.9	35	15.7	64.9	37.5	0.40	79.3	13.5	53.0
0067	63		HRS	57.5	30	16.8	62.2	36.0	0.46	73.3	14.3	53.8
0068	64		HRS	58.9	29	15.2	65.1	38.0	0.42	78.4	13.1	53.9
0069	65		HRS	58.8	24	15.5	66.0	37.8	0.41	79.9	13.1	54.3
0070	66		HRS	57.6	34	15.6	65.5	38.8	0.45	77.3	13.6	54.8
0071	67		HRS	58.3	33	15.5	64.0	36.3	0.41	77.8	13.2	53.9
0072	68		HRS	57.8	32	15.9	63.9	36.5	0.44	76.1	13.6	55.8
0073	69		HRS	57.8	34	16.6	63.3	36.3	0.44	75.5	14.4	58.8
0074	70		HRS	59.1	31	15.1	65.9	37.0	0.43	78.8	12.8	53.8
0075	71		HRS	58.0	32	14.3	67.3	42.3	0.44	79.7	12.3	54.1
0076	72		HRS	58.5	34	16.1	63.0	36.4	0.45	74.7	13.7	56.0
0077	73		HRS	59.6	23	15.5	64.6	36.3	0.41	78.4	13.4	54.8
0078	74		HRS	59.1	22	15.9	65.0	37.3	0.44	77.3	13.4	56.6
0079	75		HRS	58.3	34	15.8	63.1	35.5	0.44	75.3	13.6	54.8
0080	76		HRS	58.1	30	16.3	62.9	36.7	0.42	76.1	13.8	53.9

mean nursery flour protein = 13.5 mill used = Quad

SAMPLE#	BREEDER#	MTYPE	BABS	MTIME	LVOL	BCRGR	PROQ
0041		1M	57.2	1.9	650	9	-1
0042		3M	58.2	2.3	710	8	-1
0043		2M	59.6	2.5	720	9	-1
0044		2M	59.1	2.2	700	9	-1
0045		2M	59.0	2.1	725	9	-1
0046		2M	58.1	2.2	720	8	-1
0047		2M	57.7	2.4	710	9	-1
0048		1M	56.2	1.5	600	9	-1
0049		3M	58.0	2.4	720	8	-1
0050		3M	58.0	2.7	715	9	-1
0051		1H	58.3	1.4	665	9	-1
0052		3M	59.1	2.1	635	9	-1
0053		3M	59.0	2.4	680	9	-1
0054		3M	57.7	2.4	710	9	-1
0055		2M	57.7	1.4	605	9	-1
0056		2M	58.2	1.4	600	9	-1
0057		2M	58.7	1.4	680	9	-1
0058		1H	57.3	2.0	670	9	-1
0059		2M	58.2	2.1	610	9	-1
0060		2M	57.3	1.7	670	9	-1
0061		2M	58.1	1.3	640	9	-1
0062		1H	56.2	1.7	790	8	-1
0063		4M	58.6	2.4	600	9	-1
0064		3M	58.1	2.1	750	8	-1
0065		2M	58.6	2.0	630	9	-1
0066		1H	58.2	1.8	690	9	-1
0067		1H	58.5	1.4	630	9	-1
0068		4M	58.6	2.1	745	8	-1
0069		4M	59.0	2.4	710	9	-1
0070		4M	59.5	2.5	805	7	-1
0071		2M	58.6	2.4	650	9	-1
0072		2M	60.5	1.7	695	9	-1
0073		1M	63.5	1.5	700	9	-1
0074		3M	58.0	2.0	725	9	-1
0075		4M	58.8	2.2	760	9	-1
0076		2M	60.7	1.4	800	8	-1
0077		3M	59.5	2.5	760	8	-1
0078		3M	61.3	2.8	795	8	-1
0079		3M	59.5	2.3	645	9	-1
0080		1M	58.6	3.0	670	9	-1

mean nursery flour protein = 13.5 mill used = Quad

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0081	77		HRS	58.5	38	16.5	62.4	34.5	0.43	75.1	14.1	54.7
0082	78		HRS	58.8	34	16.7	64.6	36.8	0.45	76.3	14.4	56.1
0083	79		HRS	59.0	32	16.1	66.0	37.6	0.45	77.8	13.9	55.1
0084	80		HRS	58.7	34	16.3	64.8	36.4	0.44	77.1	14.1	56.1
0085	81		HRS	58.2	35	14.9	66.1	38.1	0.42	79.5	13.0	53.9
0086	82 /151-152		HRS	60.6	29	14.3	67.1	39.1	0.42	80.5	12.7	53.0
0087	82 /169-170		HRS	58.7	24	16.6	63.5	36.3	0.44	75.7	14.3	54.9
0088	83		HRS	58.8	38	15.4	65.4	37.2	0.43	78.2	13.3	53.9
0089	84		HRS	59.6	34	15.9	64.9	37.3	0.42	78.2	13.6	53.8
0090	85		HRS	59.4	30	16.1	64.3	36.3	0.42	77.6	13.5	55.0
0091	86		HRS	59.3	34	15.4	65.3	37.3	0.44	77.6	13.3	54.9
0092	87		HRS	59.5	24	16.0	63.1	36.1	0.43	75.8	13.6	55.9
0093	88		HRS	58.0	28	16.5	63.2	36.8	0.42	76.5	13.6	54.8
0094	89		HRS	60.0	29	15.6	64.4	36.4	0.41	78.2	13.4	55.9
0095	90		HRS	59.8	25	15.7	64.5	37.1	0.40	78.9	13.4	54.9
0096	91		HRS	59.6	30	15.3	65.1	37.1	0.41	79.0	12.9	55.0
0097	92		HRS	58.8	25	15.3	65.2	37.1	0.41	79.1	13.1	55.1
0098	94		HRS	59.6	36	16.1	64.9	36.7	0.44	77.2	13.9	55.9
0099	95		HRS	59.2	24	15.7	65.4	37.8	0.43	78.2	13.3	55.5
0100	96		HRS	58.9	33	15.8	64.2	36.6	0.42	77.5	13.7	55.0
0101	97		HRS	59.6	29	15.8	64.4	36.7	0.41	78.2	13.6	56.3
0102	98		HRS	59.5	38	15.5	65.1	37.3	0.42	78.4	13.6	56.4
0103	99		HRS	58.8	32	15.7	64.8	37.2	0.44	77.1	13.5	54.8
0104	100		HRS	59.2	36	15.7	64.4	36.8	0.42	77.7	13.4	54.9
0105	101		HRS	59.4	34	16.0	64.7	37.3	0.46	75.9	13.6	55.0
0106	102		HRS	58.9	22	15.4	65.5	38.5	0.46	76.8	13.3	55.9
0107	103		HRS	59.3	22	16.2	63.1	36.3	0.44	75.3	13.5	55.0
0108	104		HRS	58.4	33	15.8	66.7	40.0	0.47	77.5	13.5	55.1
0109	105		HRS	59.8	33	15.6	67.2	39.0	0.47	78.0	13.7	55.3
0110	106		HRS	58.4	33	16.0	66.7	39.1	0.49	76.5	13.7	54.8
0111	107		HRS	58.5	34	16.9	64.8	36.8	0.51	73.4	14.5	53.9
0112	108		HRS	59.6	32	15.7	66.8	39.4	0.49	76.6	13.5	55.0
0113	109		HRS	58.6	28	16.3	64.6	36.4	0.47	75.3	13.8	54.1
0114	110		HRS	59.8	23	16.1	66.1	37.5	0.44	78.4	13.4	53.9
0115	111		HRS	58.9	31	15.6	65.9	37.8	0.45	77.7	13.2	54.0
0116	112		HRS	59.1	35	15.9	65.0	37.3	0.47	75.7	13.8	54.9
0117	113		HRS	59.0	38	16.2	65.7	37.3	0.50	74.9	13.8	55.1
0118	114		HRS	59.0	34	15.6	65.9	37.6	0.45	77.7	13.4	53.9
0119	115		HRS	59.2	26	15.5	64.7	37.2	0.42	78.0	13.3	54.8
0120	116		HRS	59.3	32	15.3	66.1	37.7	0.43	79.0	13.3	53.2

mean nursery flour protein = 13.5 mill used = Quad

SAMPLE#	BREEDER#	WTYPE	BABS	MTIME	LVOL	BCRGR	PROQ
0081		2M	59.4	2.2	710	9	-1
0082		3M	60.8	2.2	805	6	-1
0083		3M	59.8	2.3	745	9	-1
0084		1M	60.8	1.4	620	9	-1
0085		2M	58.6	1.5	665	9	-1
0086		1M	57.7	1.5	630	9	-1
0087		2H	59.6	1.9	790	8	-1
0088		2M	58.6	2.2	690	9	-1
0089		1H	58.5	1.3	670	9	-1
0090		1H	59.7	2.0	725	8	-1
0091		2M	59.6	2.6	740	8	-1
0092		3M	60.6	2.8	760	8	-1
0093		2M	59.5	2.0	795	7	-1
0094		4M	60.6	3.1	750	9	-1
0095		3M	59.6	2.4	720	9	-1
0096		3M	59.7	2.3	665	9	-1
0097		2M	59.8	2.1	600	9	-1
0098		2M	60.6	2.9	720	8	-1
0099		2M	60.2	2.2	765	8	-1
0100		1H	60.2	1.5	695	9	-1
0101		1H	61.0	1.1	700	9	-1
0102		3M	61.1	2.5	715	8	-1
0103		3M	59.5	2.6	710	8	-1
0104		2M	59.6	1.7	670	9	-1
0105		2H	59.7	2.6	730	8	-1
0106		3M	60.6	2.5	780	6	-1
0107		1M	59.7	1.2	690	9	-1
0108		1M	59.8	1.7	640	9	-1
0109		2M	60.0	2.5	660	9	-1
0110		2M	57.5	2.4	660	9	-1
0111		3M	58.6	2.8	640	9	-1
0112		2M	59.7	2.3	715	8	-1
0113		1H	58.8	1.2	650	9	-1
0114		1H	58.6	1.5	635	9	-1
0115		1H	59.2	1.4	665	9	-1
0116		2M	60.6	2.6	755	8	-1
0117		1M	59.8	1.5	635	9	-1
0118		1H	58.1	1.5	670	9	-1
0119		2M	59.5	2.2	675	9	-1
0120		1H	57.9	1.3	675	9	-1

mean nursery flour protein = 13.5 mill used = Quad

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	F#EH	MSCOR	FPROT	MABS
0121	117		HRS	58.6	34	16.1	63.4	36.3	0.44	75.6	13.8	55.8
0122	118		HRS	59.5	31	14.9	65.0	37.3	0.43	77.8	13.1	54.4
0123	119 /574-575		HRS	58.3	32	16.3	64.1	36.9	0.47	74.8	13.9	53.8
0124	119 /589-590		HRS	59.5	35	15.9	64.7	35.9	0.42	78.0	13.8	53.7
0125	120		HRS	59.4	36	15.6	65.9	37.3	0.42	79.3	13.4	55.9
0126	121		HRS	58.7	36	15.9	64.8	37.3	0.44	77.1	13.7	55.0
0127	122		HRS	58.6	26	15.5	66.1	38.4	0.43	79.0	13.2	55.8
0128	123		HRS	59.2	29	14.8	65.8	37.1	0.43	78.6	12.9	55.9
0129	124		HRS	59.3	24	15.7	65.4	36.4	0.43	78.2	13.5	56.3
0130	125 /598-599		HRS	59.2	30	15.5	65.1	37.1	0.43	77.9	13.3	56.3
0131	125 /976-977		HRS	59.0	36	14.5	67.1	38.7	0.41	81.1	12.7	55.8
0132	126		HRS	58.9	29	15.4	66.1	37.7	0.43	79.0	13.4	55.8
0133	127		HRS	58.5	33	15.9	66.3	38.8	0.44	78.6	13.6	56.6
0134	128		HRS	58.5	32	16.5	64.5	37.5	0.44	76.8	14.2	55.1
0135	129		HRS	59.0	35	16.2	65.4	38.0	0.43	78.2	14.1	54.9
0136	130		HRS	59.7	35	15.1	67.0	37.7	0.44	79.4	13.3	54.8
0137	131		HRS	59.6	23	15.6	65.5	37.7	0.41	79.4	13.3	54.8
0138	132		HRS	59.2	27	15.6	64.3	36.1	0.40	78.6	13.3	55.0
0139	133		HRS	59.0	31	15.3	65.7	37.7	0.44	78.0	12.9	55.0
0140	134		HRS	59.1	31	16.0	64.1	35.7	0.44	76.3	13.8	55.0
0141	135 /577-578		HRS	58.3	21	16.7	63.0	35.4	0.46	74.2	14.2	56.3
0142	135 /940-941		HRS	59.4	30	16.3	64.4	35.6	0.43	77.2	14.2	55.2
0143	136 /28-29		HRS	58.3	25	15.5	65.2	36.8	0.43	78.0	13.8	55.7
0144	136 /679-680		HRS	59.6	39	15.8	65.5	36.3	0.43	78.3	13.8	54.7
0145	137 /271-272		HRS	58.4	27	16.0	64.0	37.1	0.47	74.7	14.0	55.7
0146	137 /883-884		HRS	59.0	24	16.3	63.5	35.5	0.48	73.6	14.1	55.7
0147	138		HRS	58.7	34	15.9	63.9	37.6	0.44	76.1	13.7	54.8
0148	139		HRS	58.8	22	15.6	64.6	37.7	0.43	77.4	13.7	54.8
0149	140		HRS	59.6	32	14.8	66.0	37.8	0.44	78.3	12.9	54.8
0150	141		HRS	59.7	39	15.7	63.9	35.5	0.43	76.7	13.7	56.2
0151	142		HRS	58.8	25	15.5	64.5	36.1	0.42	77.8	13.7	54.7
0152	143		HRS	59.2	30	14.7	65.3	36.1	0.43	78.1	12.9	54.7
0153	144 /67-68		HRS	59.2	32	15.6	64.9	36.3	0.42	78.2	13.4	53.7
0154	144 /541-542		HRS	59.0	28	15.8	65.7	37.3	0.42	79.1	13.8	54.8
0155	145 /676-677		HRS	59.2	27	15.7	64.7	35.6	0.43	77.5	13.6	54.8
0156	145 /802-803		HRS	58.6	27	15.9	64.1	35.1	0.42	77.4	13.5	53.9
0157	146 /349-350		HRS	59.3	37	15.0	67.0	37.4	0.42	80.4	13.2	54.8
0158	146 /553-554		HRS	59.1	31	15.8	64.5	35.9	0.43	77.3	13.9	54.8
0159	147		HRS	59.7	38	15.7	64.3	34.7	0.43	77.1	13.8	54.7
0160	148		HRS	58.5	34	16.2	63.5	35.9	0.45	75.2	14.4	55.7

mean nursery flour protein = 13.5 mill used = Quad

SAMPLE#	BREEDER#	MTYPE	BABS	MTIME	LVOL	BCRGR	PROQ
0121		1H	60.5	1.8	790	6	-1
0122		2M	59.1	2.2	730	8	-1
0123		1M	58.5	1.3	650	9	-1
0124		1H	58.4	1.1	630	9	-1
0125		3M	60.6	1.9	730	8	-1
0126		2H	60.7	2.5	730	8	-1
0127		3M	60.5	2.2	735	8	-1
0128		3M	60.6	2.5	725	8	-1
0129		3M	61.0	1.9	755	7	-1
0130		3M	61.0	2.5	725	8	-1
0131		3M	60.5	2.1	745	9	-1
0132		3M	60.5	2.5	700	8	-1
0133		3M	61.8	2.8	715	8	-1
0134		1H	59.8	1.3	700	9	-1
0135		1H	59.6	1.1	745	8	-1
0136		3M	59.5	2.8	670	9	-1
0137		3M	59.5	2.2	710	9	-1
0138		1H	59.7	1.5	680	9	-1
0139		3M	59.7	2.2	710	9	-1
0140		2H	59.7	2.5	715	9	-1
0141		3M	61.0	2.2	780	8	-1
0142		3H	59.9	2.6	690	9	-1
0143		3M	60.4	2.8	685	9	-1
0144		3M	59.4	2.5	665	9	-1
0145		3M	60.4	2.4	795	7	-1
0146		3M	60.4	2.2	760	8	-1
0147		2M	59.5	1.9	735	9	-1
0148		1M	59.5	1.2	650	9	-1
0149		3M	59.5	2.3	685	8	-1
0150		3M	60.9	2.8	690	8	-1
0151		3M	59.4	2.3	700	9	-1
0152		3M	59.4	2.2	705	9	-1
0153		2M	58.4	1.5	560	9	-1
0154		1H	59.5	1.4	675	9	-1
0155		2M	59.5	1.9	605	9	-1
0156		2M	58.6	1.9	615	9	-1
0157		3M	59.5	2.5	655	9	-1
0158		3M	59.5	1.4	680	9	-1
0159		1H	59.4	1.3	665	9	-1
0160		2H	60.4	2.2	715	8	-1

mean nursery flour protein = 13.5 mill used = Quad

S. JONES

YEAR 92 NURSERY 042 91701 SUBSTITUTION LINES (CHEYENNE 1D) Q TULELAKE, CA

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0161	149		HRS	59.1	30	15.1	65.1	37.2	0.43	77.9	13.3	53.2
0162	150		HRS	58.9	26	15.7	64.3	36.7	0.43	77.1	13.8	55.8
0163	151		HRS	58.5	27	15.6	65.0	37.1	0.43	77.8	13.7	54.8
0164	152 /334-335		HRS	59.7	26	15.1	64.7	38.3	0.40	79.1	13.2	53.7
0165	152 /952-953		HRS	59.1	23	15.4	64.4	37.8	0.42	77.7	13.6	53.8
0166	169		HRS	59.3	31	15.7	65.5	38.1	0.40	79.9	13.6	54.8

mean nursery flour protein = 13.5 mill used = Quad

SAMPLE#	BREEDER#	MTYPE	BABS	MTIME	LVOL	BCRGR	PROQ
0161		2M	57.9	1.9	600	9	-1
0162		1H	60.5	1.8	640	9	-1
0163		2H	59.5	2.2	735	8	-1
0164		1M	58.4	1.4	590	9	-1
0165		1M	60.5	1.4	615	9	-1
0166		1M	59.5	1.4	660	9	-1

mean nursery flour protein = 13.5 mill used = Quad

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0001	K9005053	02	SWS	57.6 +	34	10.6	71.9 +2	16.8	0.30 +	83.3 +	9.0	55.5
0002	K9005056	03	SWS	56.5	35	10.1	67.5 -	18.0	0.31 +	75.8 -	8.1	55.1
0003	K9005147	05	SWS	57.3	13	10.2	68.2	16.5	0.30 +	78.2	8.1	54.9
0004	K9005152	06	SWS	55.8	19	10.3	72.1 +2	19.8	0.30 +	86.6 +2	8.4	54.9
0005	K9005153	07	SWS	56.6	11	10.1	68.1	20.9	0.30 +	76.2 -	8.4	53.6
0006	K9005188	11	SWS	60.0 +2	27	10.5	68.6	16.9	0.29 +2	80.8	8.4	55.2
0007	K9005221	15	SWS	57.0	28	10.7	67.1 -	14.7	0.32	76.5 -	8.6	55.1
0008	K9005255	18	SWS	56.7	28	10.4	67.2 -	17.1	0.30 +	76.8 -	8.5	55.1
0009	K9005256	19	SWS	56.0	27	10.6	67.3 -	19.7	0.30 +	77.7 -	8.5	55.3
0010	K9005257	20	SWS	56.6	25	10.1	69.4	18.8	0.30 +	81.7	8.1	55.3
*0011	PENAWAWA	29	SWS	54.7	13	11.0	67.9	17.9	0.34	79.5	8.4	54.1
*0012	WAKANZ	30	SWS	57.0	20	9.8	70.3	18.6	0.33	80.2	8.2	53.6

* = standard mean nursery flour protein = 8.4 mill used = Buhler

Standard Mean

Nursery Mean

Nursery Standard deviation

	69.1	18.2	0.34	79.8	8.3	53.9
	68.8	18.0	0.31	79.4	8.4	54.8
	1.74	1.68	0.015	3.20	0.25	0.65

SAMPLE#	BREEDER#	MTYPE	CODI	TGS	CAVOL	SCSCOR	RVA
0001	02	2M	8.93	7	1265 -	72	187
0002	03	3M	9.26	7	1300 -	74	213
0003	05	4M	9.04	7	1380	80	263
0004	06	6M	8.88 -	7	1315	70 -	275
0005	07	3M	9.44 +	8	1335	73	288
0006	11	2M	8.85 -	7	1330	78	225
0007	15	2M	9.27	7	1315	77	239
0008	18	2M	9.40	8	1340	78	258
0009	19	2M	9.32	7	1335	78	234
0010	20	2M	9.07	8	1325	76	217
*0011	29	3M	9.27	8	1385	78	300
*0012	30	3M	9.02	8	1300	73	239

* = standard mean nursery flour protein = 8.4 mill used = Buhler

SWS	9.15	8	1342	76	270
SWS	9.15	7	1327	76	245
SWS	0.201	0.5	32.4	3.0	33.1

COMMENTS: RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0001	TREASURE	02			24							
0002	EDWALL	03			29							
*0003	PENAWAWA	04	SWS	55.9		10.8	71.8	21.0	0.34	83.3	8.0	51.5
*0004	WAKANZ	05	SWS	56.8		10.1	70.7	20.0	0.33	81.5	7.8	51.2
0005	WA007176	06	SWS	55.9		11.5	73.2 +	20.1	0.39 -2	82.4	8.4	50.5
0006	K8605043	08	SWS	58.1 +		9.9	71.7	18.3	0.30 +	83.2	7.6	50.9
0007	K8605057	09	SWS	58.4 +		9.3	65.1 -2	20.1	0.27 +2	77.0 -2	7.2	51.6
0008	WA007677	10	SWS	60.3 +2		9.7	70.5	19.5	0.29 +2	81.8	7.7	53.2
0009	K8605101	11	SWS	58.3 +		9.7	73.0 +	21.0	0.29 +2	88.3 +2	7.3	53.2
0010	K8705083	14	SWS	56.8		10.3	74.2 +2	20.1	0.32	88.1 +2	7.8	51.9
0011	K8705178	18	SWS	57.8		10.0	72.1	20.6	0.28 +2	86.6 +	7.7	51.7
0012	K8705216	19	SWS	58.0		10.1	72.0	19.0	0.28 +2	87.2 +2	7.7	52.3
0013	WA007712	20	SWS	59.6 +		9.5	72.4 +	19.2	0.26 +2	89.6 +2	7.5	52.5
0014	K8705303	21	SWS	60.4 +2		9.9	74.0 +2	19.5	0.26 +2	90.1 +2	7.4	52.6
0015	K8805178	24	SWS	57.2		10.7	72.4 +	19.4	0.27 +2	86.8 +2	8.2	52.3
0016	K8905045	28	SWS	58.0		10.6	71.8	19.6	0.30 +	85.0 +	8.2	52.5
0017	K8905333	33	SWS	55.0		10.8	71.8	24.3	0.31 +	84.6 +	8.3	51.5
0018	K8905358	37	SWS	57.3		10.7	72.3	22.3	0.29 +2	86.0 +	8.2	51.6
0019	K8905371	39	SWS	58.9 +		10.1	68.8 -2	17.6	0.30 +	79.2 -	7.8	51.9
0020	K8905375	40	SWS	58.6 +		10.7	71.1	22.2	0.31 +	83.0	8.1	53.0
0021	K8705035	42	SWS	60.0 +2		10.9	70.2	20.5	0.33	78.7 -	8.2	53.3

* = standard mean nursery flour protein = 7.8 mill used = Buhler

Standard Mean

Nursery Mean

Nursery Standard deviation

51.3
52.1
0.80

7.9
7.8
0.35

82.4
84.3
3.71

0.34
0.30
0.032

20.5
20.2
1.52

71.3
71.6
2.02

10.4
10.3
0.57

18
25
5.3

56.4
58.0
1.51

SWS
SWS
SWS

SAMPLE#	BREEDER#	MTYPE	CODI	TGS	CAVOL	SCSCOR	RVA
0001	02						
0002	03						
*0003	04	3M	8.94	7	1330	76	154
*0004	05	2M	9.40	8	1310	74	182
0005	06	2M	9.18	7	1270 -	69 -	169
0006	08	3M	8.91 -	7	1285	74	204
0007	09	2M	9.11	8	1410 +2	84 +	258
0008	10	4M	9.12	8	1310	74	239
0009	11	3M	9.05	7	1375 +	70	242
0010	14	3M	9.07	7	1330	75	222
0011	18	3M	9.19	8	1350	78	232
0012	19	2M	8.93	8	1320	76	282
0013	20	4L	9.23	8	1295	75	268
0014	21	3M	9.40	8	1250 -	69 -	248
0015	24	2M	9.34	8	1305	73	253
0016	28	5L	9.09	8	1325	76	273
0017	33	3M	8.88 -	7	1305	73	270
0018	37	3M	9.29	8	1310	76	237
0019	39	4M	8.91 -	7	1300	72	263
0020	40	3M	9.21	8	1325	76	270
0021	42	3M	9.06	8	1270 -	73	240

* = standard mean nursery flour protein = 7.8 mill used = Buhler

SWS	9.17	8	1320	75	168
SWS	9.12	8	1314	74	237
SWS	0.165	0.5	37.0	3.4	36.4

COMMENTS: Quality parameters of SWS selections in this nursery were graded by comparison to the standard mean of Penawawa and Wakanz. Treasure and Edwall were not processed for quality since other appropriate check varieties were included in the nursery. Rapid Visco Analyzer (RVA) viscosity was determined on all lines. RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable.

Alkaline flour color (COLOR) was not scored on any of these lines since their NIR wheat hardness values were less than 40.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0001	K9105018	01	SWS	61.9	31	13.3	64.3 -	38.4	0.32 -	82.6 -2	11.4 -	58.7
0002	K9105022	03	SWS	62.5	31	12.7	64.7 -	36.5	0.30	84.4 -	10.7	58.1
0003	K9105023	04	SWS	59.7 -	31	12.3	63.9 -2	35.7	0.31 -	82.7 -2	10.3	57.7
0004	K9105068	12	SWS	60.0 -	21	12.9	64.3 -	32.5	0.28	85.2	11.0	58.6
0005	K9105093	14	SWS	60.0 -	25	10.9	65.5	36.9	0.30	85.4	9.4	56.2
0006	K9105094	15	SWS	60.6	30	11.8	65.0 -	37.8	0.29	85.4	10.0	56.7
0007	K9105104	18	SWS	60.3 -	32	13.4	62.4 -2	32.9	0.31 -	80.8 -2	10.9	58.7
0008	K9100121	20	SWS	62.5	27	11.3	67.5 +	37.3	0.30	88.0	9.5	55.8
0009	K9100124	21	SWS	59.9 -	23	11.5	63.1 -2	39.6	0.35 -2	79.2 -2	9.8	55.7
0010	K9100126	22	SWS	62.1	28	11.7	68.1 +	33.5	0.35 -2	85.5	10.1	56.6
0011	K9100127	23	SWS	61.0	30	13.0	63.9 -2	40.4	0.32 -	82.1 -2	10.7	56.9
0012	K9100129	24	SWS	61.4	35	11.6	67.6 +	35.2	0.30	88.1	9.8	53.6 +
0013	K9100140	25	SWS	60.8	27	12.4	65.0 -	35.0	0.29	85.4	10.4	55.4
0014	PENAWAWA	26	SWS	62.2	29	11.9	63.0 -2	34.6	0.35 -2	79.0 -2	10.0	55.6
*0015	TREASURE	27	SWS	62.1	30	12.1	66.3	38.4	0.29	87.1	9.7	56.7

* = standard mean nursery flour protein = 10.2 mill used = Quad

Standard Mean

Nursery Mean

Nursery Standard deviation

SWS	62.1	30	12.1	66.3	38.4	0.29	87.1	9.7	56.7
SWS	61.1	29	12.2	65.0	36.3	0.31	84.1	10.2	56.7
SWS	1.02	3.6	0.75	1.74	2.39	0.023	2.90	0.59	1.44

SAMPLE#	BREEDER#	MTYPE	CODI	TGS	RVA
0001	01	1H	8.75 -2	6 -	173
0002	03	1M	8.88 -	6 -	172
0003	04	3M	8.93 -	6 -	244
0004	12	1M	9.10	6 -	139
0005	14	6M	9.32	8	182
0006	15	4M	8.89 -	7	188
0007	18	1M	8.86 -	7	192
0008	20	1M	8.95 -	7	161
0009	21	1M	8.86 -	5 -2	158
0010	22	1M	9.09	7	128
0011	23	1M	8.94 -	5 -2	167
0012	24	1M	9.02 -	7	149
0013	25	1M	8.96 -	7	215
0014	26	3M	8.86 -	6 -	226
*0015	27	3M	9.29	8	180

* = standard mean nursery flour protein = 10.2 mill used = Quad

SWS	9.29	8	180
SWS	8.98	7	178
SWS	0.160	0.9	31.7

COMMENTS: RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable.

SAMPLE#	BREEDER#	MTYPE	COOI	TGS	RVA
0001	01	3M	8.91 -	8	228
0002	03	1M	8.80 -	6 -	217
0003	08	2M	9.09	7	198
0004	09	3M	8.88 -	7	180
0005	11	2M	9.06	8	154
0006	12	3M	8.75 -2	7	215
0007	13	2M	9.44	8	212
0008	15	2M	9.05 -	7	193
0009	17	3M	8.81 -	7	225
0010	18	2M	8.98 -	7	134
0011	19	1M	8.88 -	6 -	169
0012	20	2M	9.09	6 -	162
0013	21	1H	9.24	7	170
0014	23	2M	9.07	8	154
0015	24	2M	9.10	7	168
0016	25	1M	9.18	7	182
*0017	27	3M	9.32	8	235

* = standard mean nursery flour protein = 10.0 mill used = Quad

SWS	9.32	8	235
SWS	9.04	7	188
SWS	0.189	0.7	30.1

COMMENTS: RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0001	BUTTE 86	04	HRS	61.4	82	14.4	67.7 -2	11.7	0.35 +2	78.5	13.0	69.4 +
*0002	SPILLMAN	07	HRS	60.8	79	13.1	71.9	13.5	0.41	81.8	11.6	66.0
*0003	906 R	08	HRS	60.6	58	14.3	69.1	12.7	0.38	78.5	12.1	66.0
0004	WA007675	10	HRS	60.9	56	12.7	70.5	13.9	0.39	81.4	10.9	64.3
0005	WA007676	11	HRS	61.1	62	12.0 -	73.1 +2	14.2	0.37 +	86.4 +2	10.6	65.1
0006	WA007707	17	HRS	61.8	77	13.1	72.7 +2	13.1	0.37 +	86.6 +2	11.6	66.9
0007	K8800167	18	HRS	60.5	71	12.6	72.2 +	13.2	0.40	83.3 +	11.1	66.1
0008	WA007710	19	HRS	60.7	71	13.3	71.8 +	13.0	0.40	82.9 +	11.4	67.2
0009	WA007735	22	HRS	62.6 +	64	14.1	69.1 -	12.6	0.39	78.6	11.5	65.4
0010	WA007738	25	HRS	61.2	53	13.4	72.7 +	12.6	0.38	86.2 +2	11.6	65.8
0011	WA007739	26	HRS	60.5	70	13.1	72.5 +	11.6	0.44 -2	83.4 +	11.7	66.2
0012	WA007740	27	HRS	61.9	80	13.5	69.3 -	11.7	0.44 -2	76.6 -	11.8	65.1
0013	K8900101	34	HRS	60.8	75	12.9	71.8 +	11.9	0.42 -	81.7	11.6	63.9
0014	K8900256	35	HRS	60.3	74	12.8	71.2	11.6	0.37 +	84.5 +2	11.6	67.5
0015	MN087106	44	HRS	61.2	81	14.2	69.4 -	11.9	0.39	80.4	12.1	65.4
0016	ND0000618	45	HRS	61.7	83	13.7	70.1	10.8	0.39	80.1	12.4	67.1
0017	ND0000659	46	HRS	60.9	74	14.3	66.4 -2	10.2	0.42 -	74.1 -2	12.1	67.3

* = standard mean nursery flour protein = 11.7 mill used = Buhler

Standard Mean	HRS	60.7	68	13.7	70.5	13.1	0.40	80.2	11.9	66.0
Nursery Mean	HRS	61.1	71	13.4	70.7	12.4	0.39	81.5	11.7	66.2
Nursery Standard deviation	HRS	0.61	9.4	0.70	1.95	1.09	0.025	3.52	0.56	1.33

SAMPLE#	BREEDER#	MTYPE	BABS	MTIME	LVOL	BCRGR	PROQ
0001	04	3H	71.6 +	3.0	990	4	0
*0002	07	4H	70.2	3.5	955	5	+1
*0003	08	4H	68.2	3.2	1055	4	+1
0004	10	5H	67.5	5.3 +	1000	4	+1
0005	11	5H	67.3	4.3	980	3	+1
0006	17	4H	69.1	3.6	1070 +	4	+1
0007	18	4H	68.3	2.8	940 -	5	+1
0008	19	4H	70.4	3.8	965	6	+1
0009	22	4H	68.6	3.8	970	4	+1
0010	25	4H	69.0	4.4	1025	3	+1
0011	26	4H	68.4	3.4	990	5	+1
0012	27	4H	67.3	3.0	1025	4	+1
0013	34	4H	66.1 -	3.5	990	4	+1
0014	35	5H	69.7	4.7 +	965	4	+1
0015	44	3H	68.6	3.0	965	4	+1
0016	45	4H	71.3	4.0	995	3	+1
0017	46	4H	73.5 +	4.8 +	965	4	+1

* = standard mean nursery flour protein = 11.7 mill used = Buhler

HRS	69.2	3.3	1005	4
HRS	69.1	3.8	991	4
HRS	1.84	0.72	35.3	0.8

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0001	WA007749	01	HWS	58.8	67	14.2	71.7 +	15.06	0.35 +	86.8 +2	13.0	62.2
0002	PNG00805	02	HWS	58.7	57	13.8	74.4 +2	14.85	0.37	89.3 +2	12.0	60.3
0003	PNG00805	03	HWS	58.4	66	13.6	72.0 +2	14.04	0.38	86.4 +2	12.1	60.1
0004	PNG00805	04	HWS	59.1	77	14.7	71.5 +	13.53	0.37	84.9 +	12.7	60.1
0005	K9005105	08	HWS	59.8	53	13.2	64.3 -2	15.92	0.40 -	72.3 -2	11.2	62.2
*0006	KLASIC	10	HWS	59.2	54	14.0	69.71	13.8	0.37	81.1	12.2	60.2
0007	SPILLMAN	11	HRS	58.3	71	13.2	69.35	14.1	0.35 +	83.0	11.3	60.8
0008	906 R	12										

* = standard mean nursery flour protein = 12.1 mill used = Buhler

Standard Mean	HWS	54	14.0	69.71	13.75	0.37	81.1	12.2	60.2
Nursery Mean	HWS	62	13.9	70.58	14.53	0.37	83.5	12.2	60.9
Nursery Standard deviation	HWS	9.3	0.52	3.438	0.913	0.016	6.10	0.62	1.05
Standard Mean	HWS	54	14.0	69.71	13.75	0.37	81.1	12.2	60.2
Nursery Mean	HRS	71	13.2	69.35	14.09	0.35	83.0	11.3	60.8
Nursery Standard deviation	HRS								

SAMPLE#	BREEDER#	MTYPE	BABS	MTIME	LVOL	BCRGR	PROQ	RVA	*COLOR
0001	01	2H	64.4	2.3 -	995	2	0	161	U
0002	02	3H	62.5	2.9 -	940	3	0	129	Q
0003	03	6M	61.3	4.1	970	2	+1	173	Q
0004	04	3H	63.3	2.9 -	995	2	+1	181	S
0005	08	3H	62.9	3.9	895	4	+1	204	U
*0006	10	5H	62.4	4.4	1025	3	+1	105	U
0007	11	4H	61.5	3.7	875	4	0	129	Q
0008	12								

* = standard mean nursery flour protein = 12.1 mill used = Buhler

HWS	62.4	4.4	1025	3	105
HWS	62.8	3.4	970	3	159
HWS	1.03	0.83	46.5	0.8	36.1
HWS	62.4	4.4	1025	3	105
HRS	61.5	3.7	875	4	129

COMMENTS: Check variety 906R was not processed in this nursery. RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable.

*Color represents an extremely important quality criterion in Asian types of noodles. A preliminary alkaline flour color test was initiated. An alkaline Pekar slick was used to subjectively measure flour color. The Pekar slick was prepared by pressing flour to a smooth surface, immersing in a 1.0% alkaline solution consisting of 60% K₂CO₃ and 40% Na₂CO₃ for 2 minutes. The sample rested at a room temperature of (77°F) for 4 hours before visual observation and scoring. Flours were scored by the following; S = satisfactory, Q = questionable, and U = unsatisfactory. Desirable flour color ranges from bright white through creamy yellow to bright yellow. Any dullness, brown, or greenish casts would be unacceptable.

SAMPLE#	BREEDER#	MTYPE	BABS	MTIME	LVOL	BCRGM	PROQ
0001	01	4H	65.9	3.0	960	3	+1
0002	02	3H	65.8	2.8	970	3	+1
0003	04	7H	65.8	9.9 +2	970	4	0
0004	08	4H	65.6	5.3 +	975	4	+1
0005	09	4H	66.4	3.6	990	4	+1
0006	15	3H	66.4	3.3	1005	3	+1
0007	16	3H	67.3	2.6	1010	3	0
0008	17	3H	66.5	2.4	1005	5	0
0009	18	5H	67.9	6.5 +2	985	2	+1
0010	21	5H	67.0	4.2	965	3	0
0011	23	3H	67.0	3.0	995	4	0
0012	24	4H	66.4	4.4 +	1010	3	+1
0013	25	3H	66.0	3.3	1000	3	0
0014	26	3H	65.8	3.9	975	3	+1
0015	29	5H	67.0	3.9	1040 +	4	+1
0016	30	2H	66.7	2.4	970	4	-1
0017	32	4H	69.5 +	4.3	1080 +2	3	+1
0018	34	3H	69.0 +	3.9	980	4	0
0019	35	4H	69.1 +	3.4	1015	5	+1
0020	36	4H	68.8 +	5.4 +	995	4	+1
0021	38	3H	67.4	3.3	1000	3	+1
*0022	41	3H	66.3	3.1	945 -	3	+1
*0023	42	3H	66.3	3.0	1030 +	4	+1

* = standard mean nursery flour protein = 12.7 mill used = Quad

HRS	66.3	3.0	988	4
HRS	67.0	4.0	994	4
HRS	1.16	1.64	29.6	0.7

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0001	K9100017	01	HRS	61.2	65	11.7 -	65.5 +2	27.6	0.41 -2	79.4	10.2 -	57.3 -2
0002	K9100034	03	HRS	62.3	68	10.8 -2	66.8 +2	31.3	0.39 -2	81.8	9.6 -	58.3 -2
0003	K9100038	07	HRS	62.6	73	12.0 -	66.3 +2	30.1	0.38 -	81.8	10.4 -	55.7 -2
0004	K9100058	08	HRS	62.2	74	11.4 -	65.6 +2	31.7	0.38 -	81.1	9.9 -	55.8 -2
0005	K9100065	10	HRS	61.9	69	13.0	65.3 +	30.5	0.40 -2	79.7	11.2	60.1 -
0006	K9100067	11	HRS	60.1 -	67	12.5 -	61.5 -	27.9	0.40 -2	75.7 -2	10.9	61.2
0007	K9100068	12	HRS	60.8	53	11.0 -2	67.4 +2	31.0	0.43 -2	80.3	9.7 -	58.7 -
0008	K9100070	13	HRS	59.6 -	66	12.8	64.4 +	29.9	0.42 -2	77.7 -	10.7 -	57.2 -2
0009	K9100071	14	HRS	61.4	73	13.1	66.0 +2	30.7	0.37 -	82.0	11.7	58.9 -
0010	K9100074	15	HRS	61.5	75	12.0 -	65.3 +	29.8	0.40 -2	79.7	10.4 -	57.7 -2
0011	K9100085	16	HRS	60.8	77	11.9 -	67.6 +2	32.6	0.41 -2	81.6	10.3 -	58.7 -
0012	K9100088	17	HRS	58.2 -2	82	12.3 -	61.5 -	27.7	0.45 -2	73.1 -2	10.9	58.1 -2
0013	K9100094	18	HRS	61.0	87	12.9	62.9	26.1	0.41 -2	76.7 -	11.3	56.5 -2
0014	K9100109	21	HRS	59.2 -	76	11.2 -2	65.7 +2	31.4	0.46 -2	77.0 -	9.8 -	55.0 -2
0015	K9100143	27	HRS	60.8	62	11.9 -	69.1 +2	31.5	0.36 -	85.8 +2	10.7 -	56.5 -2
0016	K9100154	28	HRS	59.2 -	65	12.8	63.2	25.8	0.40 -2	77.5 -	10.8	56.7 -2
0017	K9100160	29	HRS	59.7 -	65	11.2 -2	65.6 +2	30.8	0.33	83.7 +	9.9 -	56.2 -2
0018	K9100164	30	HRS	63.1	55	12.2 -	65.5 +2	27.9	0.36 -	82.0	10.5 -	59.1 -
0019	K9100174	31	HRS	60.1 -	74	12.7 -	64.5 +	30.9	0.33	82.5	10.9	60.0 -
*0020	906 R	33	HRS	62.4	59	14.3	63.3	27.2	0.34	80.7	12.2	63.8

* = standard mean nursery flour protein = 10.6 mill used = Quad

Standard Mean

Nursery Mean

Nursery Standard deviation

HRS	62.4	59	14.3	63.3	27.2	0.34	80.7	12.2	63.8
HRS	60.9	69	12.2	65.2	29.6	0.39	80.0	10.6	58.1
HRS	1.31	8.5	0.86	1.95	2.01	0.036	3.00	0.68	2.12

SAMPLE#	BREEDER#	MTYPE	BABS	MTIME	LVOL	BCGR	PROQ
0001	01	6M	61.5 -2	3.7	910 -	6	+1
0002	03	6M	61.5 -2	3.5	845 -2	6	+1
0003	07	3H	59.9 -2	2.5 -	895 -	5	+1
0004	08	6M	61.0 -2	4.4	825 -2	6	+1
0005	10	4H	63.3 -2	3.3	895 -	4	+1
0006	11	5H	65.9 -	4.4	875 -2	4	+1
0007	12	7M	62.9 -2	5.6 +	875 -2	5	+1
0008	13	4M	63.4 -2	3.0	920 -	6	+1
0009	14	3M	63.1 -2	2.4 -	935	5	+1
0010	15	4M	62.9 -2	3.4	865 -2	6	+1
0011	16	3H	58.9 -2	2.6 -	915 -	5	+1
0012	17	3H	64.3 -2	2.4 -	840 -2	5	0
0013	18	3H	61.7 -2	2.6 -	915 -	6	+1
0014	21	6M	60.2 -2	4.2	840 -2	7	+1
0015	27	5M	61.7 -2	3.9	945	4	+1
0016	28	4H	62.9 -2	3.6	960	4	+1
0017	29	4H	60.9 -2	3.9	885 -2	5	+1
0018	30	6H	64.3 -2	5.5 +	890 -2	6	+1
0019	31	3H	64.2 -2	3.3	980	4	+1
*0020	33	3H	69.0	3.9	975	3	+1

* = standard mean nursery flour protein = 10.6 mill used = Quad

HRS	69.0	3.9	975	3
HRS	62.7	3.6	899	5
HRS	2.27	0.92	45.0	1.0

* = standard mean nursery flour protein = 11.3 mill used = Quad

Standard Mean
Nursery Mean
Nursery Standard deviation

SAMPLE#	BREEDER#	MTYPE	BABS	MTIME	LVOL	BCRGR	PROQ	RVA	COLOR*
*0001	01	4H	65.1	3.6	915	5	+1		
*0002	02	3H	63.6	3.0	925	2	+1		
0003	03	4H	64.5	3.9	990 +	6	+1		
0004	04	3H	62.3	3.0	930	5	+1		
0005	05	7H	68.2 +	8.6 +2	935	4	-1		
0006	06	5H	59.6 -2	6.5 +2	955	4	+1		
0007	07	2H	64.4	1.8 -	805 -2	6	-1		
0008	08	3H	63.4	3.6	980 +	3	+1		
0009	09	5H	63.4	5.1 +	950	3	+1		
0010	10	5H	60.1 -	4.7 +	875 -	4	+1		
0011	11	4H	63.6	3.6	990 +	4	+1		
0012	12	3H	64.5	3.0	1040 +2	4	+1		
0013	13	3H	64.3	2.5	1025 +2	5	+1		
0014	14	4H	61.5 -	3.7	865 -2	6	+1	267	S
0015	15	4H	60.6 -2	4.5	825 -2	6	0	257	S
*0016	16	5H	65.3	3.9	1100	2	+1	121	
0017	17	8M	57.5 -2	4.8	790 -2	6	+1	113	
0018	18	3H	58.5 -2	3.1	835 -2	8	0	70	
0019	19	4H	59.6 -2	3.3	830 -2	8	0	50	
0020	20	2H	61.2 -	2.5 -	955 -2	6	0	146	
* = standard mean nursery flour protein = 11.3 mill used = Quad									
HRS			64.3	3.3	920				
HRS			63.6	4.1	947	4	1		
HRS			2.16	1.82	62.5	1.2	0.8		
HWS			65.3	3.9	1100				
HWS			60.6	3.7	886	6	0	146	
HWS			2.53	0.80	107.8	2.0	0.5	85.3	

COMMENTS: RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable.

*Color represents an extremely important quality criterion in Asian types of noodles. A preliminary alkaline flour color test was initiated. An alkaline Pekar slick was used to subjectively measure flour color. The Pekar slick was prepared by pressing flour to a smooth surface, immersing in a 1.0% alkaline solution consisting of 60% K₂CO₃ and 40% Na₂CO₃ for 2 minutes. The sample rested at a room temperature of (77°F) for 4 hours before visual observation and scoring. Flours were scored by the following: S = satisfactory, Q = questionable, and U = unsatisfactory. Desirable flour color ranges from bright white through creamy yellow to bright yellow. Any dullness, brown, or greenish casts would be unacceptable. Alkaline flour color (COLOR) is scored only on SWS, HWS and HWS wheats which have a minimum RVA viscosity of 150 and a minimum NIR wheat hardness (UWHRD) value of 40.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0001	SD008070	10	HRS	58.4	87	12.8	63.9	26.1	0.33 -	81.9	12.4	66.4 +
0002	MN088415	13	HRS	60.0	84	13.6	64.0	25.8	0.33 -	82.0	12.5	66.8 +
0003	MN089028	14	HRS	58.3	73	12.9	64.9 +	29.2	0.31	84.0	11.9	64.4 +
0004	ND000673	17	HRS	60.1	76	12.2	64.5	25.6	0.31	83.6	12.0	65.5 +
0005	N8800022	24	HRS	58.4	60	11.6	63.9	28.0	0.33 -	81.9	10.4	59.7
0006	N8600348	27	HRS	58.4	67	12.8	61.5 -2	22.5	0.33 -	79.4 -	11.3	61.5
0007	MT008849	28	HRS	59.5	74	13.3	59.3 -2	20.3	0.35 -	76.0 -2	11.2	63.3
0008	PH986061	32	HRS	59.6	63	10.7 -	63.7	26.5	0.32	82.2	9.9	58.4 -
0009	TR983239	33	HRS	62.5 +	73	11.8	63.6	21.0	0.33 -	81.6	10.3	60.7
*0010	906 R	34	HRS	59.7	63	12.5	63.8	26.6	0.31	82.8	11.1	61.7

* = standard mean nursery flour protein = 11.3 mill used = Quad

Standard Mean

Nursery Mean

Nursery Standard deviation

HRS	59.7	63	12.5	63.8	26.6	0.31	82.8	11.1	61.7
HRS	59.5	72	12.4	63.3	25.2	0.32	81.5	11.3	62.8
HRS	1.28	9.0	0.87	1.66	2.94	0.013	2.31	0.90	2.89

SAMPLE#	BREEDER#	MTYPE	BABS	MTIME	LVOL	BCRGR	PROQ
0001	10	4H	68.6	5.5	985	4	+1
0002	13	4H	69.0 +	4.4	855 -2	4	-1
0003	14	5H	66.6	5.3	965	2	+1
0004	17	5H	67.7	6.3	970	3	+1
0005	24	8M	61.9 -	4.6	875 -2	4	+1
0006	27	4H	63.7 -	4.6	890 -	4	0
0007	28	7H	71.5 +2	7.2 +	990	4	+1
0008	32	8M	65.6	7.4 +	885 -	4	+1
0009	33	4M	70.9 +	3.7 -	935	4	+1
*0010	34	7M	66.4	5.3	960	2	+1

* = standard mean nursery flour protein = 11.3 mill used = Quad

HRS	66.4	5.3	960	2
HRS	67.2	5.4	931	4
HRS	3.01	1.21	50.2	0.8

COMMENTS: Quality parameters of HRS lines in this nursery were graded by comparison to the standard mean of 906R.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS	MTYPE	COOI	TGS	RVA
0001	OWENS	21	SWS	59.2	25	11.0	63.5 -2	42.5	0.30 +	82.9 -	9.3	54.7	2M	9.11	8	296
*0002	TREASURE	22	SWS	60.9	27	11.2	67.2	39.5	0.32	86.3	9.0	53.2	3M	9.05	8	205
0003	PENAWAWA	23	SWS	58.3 -	14	11.2	61.6 -2	38.4	0.38 -2	75.3 -2	9.2	53.4	3M	9.19	8	276
*0004	WAKANZ	24	SWS	59.1	25	11.1	66.7	38.4	0.35	83.8	9.3	54.6	2M	9.19	8	218
0005	WADUAL	25	SWS	59.8	25	11.7	Milling error - flour lost									
0006	ID000448	26	SWS	61.6	29	10.7	Milling error - flour lost									
0007	ID000449	27	SWS	61.7 +	27	11.5	65.9	38.4	0.33	84.0	9.4	53.8	2M	8.96	7	219
0008	ID000450	28	SWS	61.5	29	10.9	66.5	35.8	0.32	85.4	9.0	53.1	2M	9.31	8	287
0009	OR488013	29	SWS	61.6	28	11.6	65.4 -	35.0	0.31 +	84.6	9.6	53.4	2M	8.71 -	7	273
0010	WA007176	30	SWS	58.2 -	14	11.5	63.9 -2	38.0	0.38 -2	78.3 -2	9.5	53.1	1M	9.33	8	213
0011	WA007497	31	SWS	58.9	26	11.6	68.0	37.5	0.33	86.7	9.6	53.3	3M	9.06	8	217
0012	WA007677	32	SWS	62.4 +	25	10.9	64.2 -2	37.0	0.30 +	83.8	9.1	54.1	3M	9.30	8	290
0013	WA007712	33	SWS	62.2 +	34	10.7	66.7	36.9	0.26 +2	89.5 +2	8.9	54.3	3L	9.18	7	246
0014	WA007715	34	SWS	61.0	32	11.5	66.3	35.7	0.37 -	82.0 -	9.7	54.7	3M	9.26	7	247
0015	HF927176	35	SWS	59.0	20	11.1	63.6 -2	38.7	0.36 -	79.2 -2	9.3	49.6 +	1M	9.31	8	208
0016	906R	36	HRS													

* = standard mean nursery flour protein = 9.3 mill used = Quad

Standard Mean	SWS	60.0	26	11.1	66.9	39.0	0.34	85.1	9.1	53.9	9.12	8	212
Nursery Mean	SWS	60.4	25	11.2	65.3	37.8	0.33	83.2	9.3	53.5	9.15	8	246
Nursery Standard deviation	SWS	1.48	5.6	0.34	1.84	1.93	0.036	3.80	0.25	1.32	0.176	0.5	34.5

COMMENTS: Quality parameters of SWS selections in this nursery were graded by comparison to the standard mean of Treasure and Wakanz. Breeder #'s 25 and 26 were lost due to milling errors caused by inadvertent compositing of the wheats. Breeder #36 (906R) was not processed for quality in this nursery. Rapid Visco Analyzers (RVA) viscosity was determined on all lines. RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable.

Alkaline flour color (COLOR) was not scored on any selections since all had NIR wheat hardness values less than 40.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UMHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
*0001	WANSER	1	HRW	61.9	56	9.6	67.9	13.6	0.37	76.3	8.1	57.0
0002	OR 850513	2	HWW	63.8 +	73	9.4	69.3 +	10.9	0.40 -	78.3	8.6	57.0
0003	OR 860794	3	HWW	61.5	70	10.0	67.4	9.9	0.40 -	73.4 -	8.6	57.9
0004	OR 861599	4	HWW	61.1	83	10.8	64.4 -	9.4	0.40 -	69.0 -	9.5	59.2
0005	OR 889071	5	HWW	61.6	77	10.2	63.4 -	9.6	0.45 -	66.3 -	9.5	60.0 +
0006	OR 889088	6	HWW	62.2	79	10.6	62.8 -	9.1	0.44 -	66.1 -	9.8 +	59.6
0007	OR 889176	7	HWW	61.8	69	11.1	69.1 +	10.6	0.41 -	79.2 +	9.7 +	60.3 +
0008	OR 870512	8	HWW	62.8	67	10.5	60.8 -	8.7	0.40 -	65.1 -	8.9	59.9 +
0009	OR 870944	9	HWW	61.9	77	8.5	61.2 -	9.3	0.46 -	62.9 -	7.6	59.4
0010	OR 871121	10	HWW	61.5	63	10.2	66.3 -	10.9	0.37	74.3	9.0	60.3 +
0011	OR 871143	11	HWW	63.3	76	9.4	68.4	10.2	0.36	78.8 +	8.5	60.6 +
0012	OR 871144	12	HWW	62.8	80	9.2	69.0 +	11.1	0.36	80.7 +	8.0	57.9
0013	OR 880017	13	HWW	62.1	60	10.3	64.8 -	9.5	0.33 +	74.1 -	8.8	59.0
0014	OR 2862	14	HWW	60.1 -	69	9.4	66.8	12.1	0.44 -	72.8 -	7.9	58.2
0015	OR 8403939H	15	SRW	61.5	43	9.5	71.0 +	14.2	0.32 +	84.7 +	7.8	55.3
0016	OR 881191	16	HRW	60.1 -	54	11.0	67.5	11.2	0.39	73.2 -	9.2	59.5
0017	OR 890074	17	HWW	60.6	70	10.6	61.8 -	7.9	0.42 -	64.1 -	9.1	59.4
0018	OR 890145	18	HWW	60.4	63	10.4	66.5 -	10.7	0.37	73.7 -	9.3	59.0
0019	OR 860247	19	HRW	61.8	79	10.1	67.5	12.2	0.35 +	77.4	9.0	59.6
0020	OR 861555	20	SRW	60.5	45	9.8	64.8 -	11.9	0.41 -	70.2 -	8.0	56.2
0021	OR 8501911	21	HRW	62.5	79	9.0	64.3 -	9.2	0.41 -	70.3 -	8.2	57.1
0022	OR 870812	22	HRW	61.0	53	9.6	61.0 -	9.5	0.41 -	62.3 -	8.4	55.9
0023	OR 870834	23	SRW	60.7	39	9.2	64.4 -	12.9	0.40 -	70.3 -	7.6	56.0
0024	OR 870957	24	HRW	61.0	73	9.6	65.7 -	9.6	0.35 +	76.5	8.5	58.5
0025	OR 3870020	25	HRW	62.9	84	10.7	64.2 -	9.7	0.36	73.4 -	9.3	59.5
0026	OR 2619	26	HRW	63.1	79	10.4	63.8 -	7.9	0.43 -	68.5 -	8.8	56.2
0027	OR 889128	27	HRW	58.5 -	62	9.8	69.9 +	11.9	0.40 -	81.8 +	8.0	55.1
0028	OR 870045	28	HWW	61.3	80	9.7	69.8 +	10.1	0.39	77.8	8.4	55.7
0029	OR 890086	29	HRW	59.2 -	67	10.3	60.8 -	7.0	0.43 -	63.5 -	8.3	56.7
0030	OR 899135	30	HRW	62.7	74	8.1	62.5 -	8.2	0.43 -	66.2 -	7.5	54.7
0031	OR 899345	31	HRW	60.4	63	7.8 -	60.4 -	10.0	0.44 -	62.8 -	7.1	54.9
0032	92 HRRAN 25	32	SRW	62.3	29	10.1	63.0 -	14.2	0.37	68.6 -	8.2	53.2 -

* = standard mill used = Buhler

mean nursery flour protein = 8.5

Standard Mean	HRW	61.9	56	9.6	67.9	13.6	0.37	76.3	8.1	57.0
Nursery Mean	HRW	61.3	69	9.7	64.6	10.0	0.40	71.0	8.4	57.1
Nursery Standard deviation	HRW	1.49	10.9	0.97	3.13	1.92	0.033	6.43	0.66	1.83
Standard Mean	HRW	61.9	56	9.6	67.9	13.6	0.37	76.3	8.1	57.0
Nursery Mean	HWW	61.8	72	10.0	65.7	10.0	0.40	72.3	8.8	59.0
Nursery Standard deviation	HWW	1.03	6.9	0.69	3.05	1.05	0.036	5.94	0.65	1.33
Standard Mean	HRW	61.9	56	9.6	67.9	13.6	0.37	76.3	8.1	57.0
Nursery Mean	SRW	61.2	39	9.6	65.8	13.3	0.38	73.4	7.9	55.2
Nursery Standard deviation	SRW	0.82	7.1	0.39	3.52	1.08	0.040	7.54	0.26	1.37

SAMPLE#	BREEDER#	MTYPE	CODI	TGS	BABS	MTIME	LVOL	BCRGR	PROQ	RVA	COLOR*
*0001	1	6M	8.38	5	60.2	3.4	770	7	+1	115	
0002	2	4M	8.39	4						191	S
0003	3	5M	7.68	5						81	
0004	4	8M	7.61	4	65.4 +2	5.0 +	850 +	5	+1	181	S
0005	5	5M	7.70	6	65.2 +2	3.4	730	8	-1	205	S
0006	6	4M	7.72	6	62.8 +	3.3	735	8	-1	204	S
0007	7	2H	7.73	4	62.5	1.8 -	780	8	0	185	S
0008	8	6M	7.66	6						171	S
0009	9	4L	7.60	3 -						197	S
0010	10	5M	7.90	6						142	
0011	11	3M	7.67	5						124	
0012	12	3M	7.70	6						130	
0013	13	3M	8.10	7 +						162	U
0014	14	3M	7.68	4						127	
0015	15	4L	8.31	8 +2						74	
0016	16	4M	7.82	6	63.7 +	2.3	670 -2	7	-1	118	
0017	17	6M	7.46	4						132	
0018	18	6M	7.95	7 +						78	
0019	19	6M	7.77	6						156	
0020	20	6L	8.06	6						127	
0021	21	4M	7.74	6						108	
0022	22	4M	7.51	4						130	
0023	23	6M	8.14	5						126	
0024	24	6M	7.85	4						166	
0025	25	4M	7.69	5						178	
0026	26	3M	7.66	3 -						66	
0027	27	2M	8.07	6						119	
0028	28	4M	7.90	5						138	
0029	29	3L	7.64	4						153	
0030	30	3L	7.69	5						20	
0031	31	2L	7.89	6						31	
0032	32	1L	8.09	7 +						92	

* = standard mean nursery flour protein = 8.5 mill used = Buhler

HRW	8.38	5	60.2	3.4	770	7	115
HRW	7.81	5	62.0	2.9	720	7	113
HRW	0.229	1.0	2.47	0.78	70.7	0.0	50.8
HRW	8.38	5	60.2	3.4	770	7	115
HWW	7.78	5	64.0	3.4	774	7	153
HWW	0.225	1.2	1.54	1.31	55.6	1.5	40.4
HRW	8.38	5	60.2	3.4	770	7	115
SRW	8.15	6					105
SRW	0.112	1.3					26.2

COMMENTS: Quality parameters of HRW, HWW and SRW lines in this nursery were graded by comparison to the standard mean of Wanser. Breeder #'s 15, 20, 23 and 32 had NIR wheat hardness (UWHRD) values less than 50 and were classified as SRW. Cookies were baked on all lines. Wanser and Breeder #'s 4, 5, 6, 7 & 16 which exhibited the stronger type mixing properties (based on mixogram type) were selected for bread baking. Those selected were not considered as satisfactory for bread baking. The mean nursery flour protein content was only 8.5%. All other lines not bread-baked had poorer mixing properties and low flour protein content.

Rapid Visco Analyzer (RVA) viscosity was determined on all lines. RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable.

Alkaline flour color (COLOR) was scored on a few HWW lines. *Color represents an extremely important quality criterion in Asian types of noodles. A preliminary alkaline flour color test was initiated. An alkaline Pekar slick was used to subjectively measure flour color. The Pekar slick was prepared by pressing flour to a smooth surface, immersing in a 1.0% alkaline solution consisting of 60% K₂CO₃ and 40% Na₂CO₃ for 2 minutes. The sample rested at a room temperature of (77°F) for 4 hours before visual observation and scoring. Flours were scored by the following; S = satisfactory, Q = questionable, and U = unsatisfactory. Desirable flour color ranges from bright white through creamy yellow to bright yellow. Any dullness, brown, or greenish casts would be unacceptable. Alkaline flour color (COLOR) is scored only on SWW, HWW, SWS and HWS wheats which have a minimum RVA viscosity of 150 and a minimum NIR wheat hardness (UWHRD) value of 40.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS	MTYPE	RVA
*0001	WANSER	1	HRW	62.2	40	8.6	65.1	35.3	0.37	81.1	7.0	49.9	4L	
0002	OR 8301134	2	HRW	65.2 +	58	10.1	63.1	29.0	0.32 +2	81.6	8.5 +	52.9 +	6M	
0003	POLUKARLIKOVA	3	HRW	65.0 +	55	10.4 +	62.2 -2	28.3	0.31 +2	81.2	8.9 +	51.5	6M	
0004	PROSTOR	4	SRW	62.9	33	10.8 +	62.8 -2	30.0	0.34 +	79.4	8.8 +	51.4	6M	
0005	92HRRAN 27	5	HRW	63.3	59	9.4	58.0 -2	22.0	0.42 -2	71.0 -2	7.6	51.0	3L	
0006	KARL	6	HRW	63.8	57	10.8 +	61.9 -2	29.0	0.33 +	79.8	9.7 +	52.9 +	7M	
0007	92HRRAN 29	7	HRW	63.1	53	10.8 +	58.7 -2	22.2	0.41 -	72.3 -2	9.0 +	52.2	4L	
0008	PERESVET	8	HRW	65.5 +	55	9.8	58.8 -2	24.0	0.34 +	76.0 -2	8.3	51.7	6L	
0009	OR 908093	9	HRW	62.7	57	8.7	59.6 -2	27.2	0.33 +	77.4 -	7.1	50.5	2L	
0010	OR 908124	10	HRW	60.8	50	8.9	60.4 -2	19.1	0.40 -	74.6 -2	7.3	50.2	3L	
0011	OR 889303	11	SWW	60.9	46	11.1 +	63.7 -	29.8	0.36	79.3	8.8 +	48.8	2M	86
0012	OR 870806	12	HWW	62.6	52	9.0	59.4 -2	26.9	0.32 +2	77.7 -	6.8	50.5	2L	50

* = standard mean nursery flour protein = 8.2 mill used = Quad

Standard Mean	HRW	62.2	40	8.6	65.1	35.3	0.37	81.1	7.0	49.9
Nursery Mean	HRW	63.5	54	9.7	60.9	26.2	0.36	77.2	8.2	51.4
Nursery Standard deviation	HRW	1.54	5.8	0.87	2.37	4.91	0.042	4.00	0.95	1.11
Standard Mean	HRW	62.2	40	8.6	65.1	35.3	0.37	81.1	7.0	49.9
Nursery Mean	SRW	62.9	33	10.8	62.8	30.0	0.34	79.4	8.8	51.4
Standard Mean	HRW	62.2	40	8.6	65.1	35.3	0.37	81.1	7.0	49.9
Nursery Mean	SWW	60.9	46	11.1	63.7	29.8	0.36	79.3	8.8	48.8
Standard Mean	HRW	62.2	40	8.6	65.1	35.3	0.37	81.1	7.0	49.9
Nursery Mean	HWW	62.6	52	9.0	59.4	26.9	0.32	77.7	6.8	50.5

COMMENTS: Quality parameters of HRW, SWW and HWW selections in this nursery were graded by comparison to the standard mean of Wanser. Breeder #4 (Prostor) and Breeder #11 (OR889303) had MIE wheat hardness value less than 50 and were classified as SRW and SWW respectively. All selections were milled and run through the normal quality tests including mixograms, however no bread baking was done on any of the lines due to their low flour protein content (mean nursery flour protein content - 8.2%). Mixograms of all lines exhibited low water absorption and weak mixing properties. Some lines had mixograms typed (MTYPE) as low (L) and the others were medium (M), hence no bread baking was done.

Rapid visco analyzer (RVA) viscosity was determined on Breeder #'s 11 and 12. RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
*0001	WANSER	1	HRW	62.2	52	7.9	64.5	34.6	0.34	82.0	6.8	54.2
0002	OR 900328	2	HRW	63.4	66	8.3	61.8 -2	24.4	0.39 -2	76.6 -2	7.4	55.5
0003	OR 900468	3	HRW	64.3 +	60	9.4	65.6	26.9	0.37 -	81.6	7.6	56.3
0004	OR 900489	4	HRW	64.7 +	77	9.0	60.6 -2	19.9	0.40 -2	74.8 -2	7.5	55.8
0005	OR 900534	5	HRW	63.6	61	9.0	65.1	29.6	0.33	83.1	7.5	55.4
0006	OR 900204	6	HRW	60.7	73	7.9	64.7	31.2	0.35	81.7	6.9	54.5
0007	OR 900220	7	HRW	61.1	59	8.3	64.7	28.1	0.35	81.7	7.1	54.5
0008	OR 908103	8	HRW		42	8.0						
0009	OR 908107	9	HRW	61.1	54	8.7	65.7 +	29.6	0.39 -2	80.6	6.9	53.3
0010	OR 908109	10	HRW	62.7	57	8.6	65.9 +	27.3	0.35	82.9	7.1	54.7
0011	OR 908110	11	HRW	61.4	67	7.8	64.4	27.2	0.34	81.9	6.9	54.5
0012	OR 908116	12	HRW	269. +2	57	8.7	62.1 -2	27.2	0.37 -	77.9 -	6.8	54.5
0013	OR 908118	13	HRW	62.4	65	8.3	60.4 -2	21.3	0.38 -	75.6 -2	6.9	55.3
0014	OR 908120	14	HRW	62.4	62	8.8	60.0 -2	21.4	0.39 -2	74.7 -2	6.9	55.3
0015	OR 908125	15	HRW	59.7 -	64	8.6	63.8	27.2	0.39 -2	78.6 -	7.1	54.3
0016	OR 908127	16	HRW	62.4	55	8.0	65.1	31.7	0.34	82.6	6.5	56.0
0017	OR 908158	17	HRW	62.1	64	8.0	64.1	30.1	0.36 -	80.5	7.0	55.3
0018	OR 908186	18	HRW	59.5 -	63	8.8	61.4 -2	26.0	0.35	78.2 -	6.7	54.2
0019	OR 908210	19	HRW	58.9 -	66	8.2	64.3	31.9	0.35	81.3	6.6	54.5
0020	OR 908232	20	HRW		44	8.7						
0021	OR 908243	21	HRW	64.0 +	73	9.3	65.0	27.4	0.38 -	80.4	8.1	57.8 +
0022	OR 908244	22	HRW	62.0	69	8.6	63.4	26.6	0.41 -2	77.2 -2	7.1	56.5
0023	OR 908247	23	HRW	63.4	61	9.0	62.9 -	24.8	0.41 -2	76.7 -2	7.7	55.8
0024	OR 908263	24	HRW	62.8	61	8.3	63.8	27.1	0.39 -2	78.6 -	7.1	56.5
0025	OR 908264	25	HRW	63.7	78	9.8 +	64.0	25.5	0.41 -2	77.8 -	8.9 +	58.3 +
0026	OR 908292	26	HRW		46	7.9						
0027	OR 908295	27	HRW	59.7 -	54	7.7	64.7	34.0	0.33	82.7	6.5	53.3
0028	OR 908296	28	HRW	59.4 -	52	7.4	64.9	34.3	0.34	82.4	6.3	54.2
0029	OR 908299	29	HRW		43	7.7						
0030	OR 910025	30	HRW		48	10.0 +						
0031	OR 910049	31	HRW	62.0	66	8.7	64.1	27.8	0.40 -2	78.4 -	7.3	55.3
0032	OR 910050	32	HRW	62.2	66	9.3	62.4 -	24.6	0.41 -2	76.1 -2	7.9	55.3
0033	OR 910117	33	HRW	62.3	77	8.9	62.4 -	23.6	0.35	79.3 -	7.8	55.5
0034	OR 910186	34	HRW	60.8	73	10.3 +	65.1	26.3	0.37 -	81.1	9.1 +	57.3 +
0035	OR 910187	35	HRW	61.4	68	11.2 +2	63.5	25.0	0.35	80.4	9.4 +	57.3 +
0036	OR 910191	36	HRW	60.1 -	62	7.8	63.8	29.4	0.36 -	80.2	6.7	54.5
0037	OR 910215	37	HRW	62.0	74	10.8 +	63.3 -	23.0	0.37 -	79.2 -	9.4 +	57.3 +
0038	OR 910227	38	HRW	62.8	62	9.8 +	64.3	27.9	0.33	82.3	8.3 +	56.4
0039	OR 910231	39	HRW	61.3	74	11.0 +2	61.3 -2	21.7	0.36 -	77.6 -2	8.5 +	56.1
0040	OR 910233	40	HRW	61.3	81	10.1 +	60.5 -2	21.0	0.37 -	76.2 -2	8.3 +	50.6 -

* = standard mean nursery flour protein = 7.7 mill used = Quad

SAMPLE#	BREEDER#	MTYPE	BABS	MTIME	LVOL	BCRGR	PROQ
*0001	1	3L	59.4	3.3	695	8	+1
0002	2	3M					
0003	3	4M					
0004	4	3M					
0005	5	4L					
0006	6	3L					
0007	7	2L					
0008	8						
0009	9	5L					
0010	10	3L					
0011	11	3L					
0012	12	3L					
0013	13	4L					
0014	14	4L					
0015	15	4L					
0016	16	6L					
0017	17	4L					
0018	18	4L					
0019	19	3L					
0020	20						
0021	21	6M					
0022	22	4M					
0023	23	3M					
0024	24	4L					
0025	25	2M					
0026	26						
0027	27	5L					
0028	28	4L					
0029	29						
0030	30						
0031	31	3L					
0032	32	3L					
0033	33	3M					
0034	34	3M					
0035	35	3M	67.5 +2	3.0	695	9	-1
0036	36	4L					
0037	37	6M	66.0 +2	3.2	730	9	0
0038	38	4L					
0039	39	4M					
0040	40	4M					

* = standard mean nursery flour protein = 7.7 mill used = Quad

SAMPLE#	BREEDER#	MTYPE	BABS	MTIME	LVOL	BCRGR	PROQ
0041	41	4M					
0042	42	3M					
0043	43	3H	64.7 +2	3.5	820 +2	6	0
0044	44	3H	64.5 +2	2.7	795 +2	6	-1
0045	45	3H	65.5 +2	3.0	640 -	9	-1
0046	46	3H	64.3 +2	3.8	780 +2	8	0
0047	47	4M					
0048	48	3M					

* = standard mean nursery flour protein = 7.7 mill used = Quad

HRW	59.4	3.3	695	8
HRW	64.6	3.1	729	8
HRW	2.77	0.28	67.6	1.5
HRW	59.4	3.3	695	8
HWW	64.3	3.8	780	8
HWW				

COMMENTS: Quality parameters of HRW lines in this nursery were graded by comparison to the standard mean of Wanser. Breeder #'s 8, 20, 26, 29 and 30 had NIR wheat hardness value less than 50 and were excluded from further testing. Wheat and flour protein content of most lines were very low (mean nursery flour protein content - 7.7%). With this level of flour protein content, nearly all of the lines were not suitable (weak mixing properties, etc.) for bread baking. Most had very poor mixogram types (inadequate bread types) i.e., low water absorption, very weak mixing and gluten strength properties. Wanser, breeder #'s 35, 37, 43, 44, 45 and 46 were selected for bread baking, since they exhibited the stronger type mixograms and higher flour protein content. Some of these lines had loaf volume near that expected for their flour protein content as graded by their protein quality (PROQ) rating, however, bread crumb grain was poor for most of them. It is difficult and almost useless to try to assess bread quality on bread type wheats with such low protein content. We recommend a minimum of 12.0% wheat protein and 10.5% flour protein content for bread baking types.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0001	OR 889085	1	HWW	61.0	61	9.5	63.1 -2	27.9	0.40 -2	77.4 -2	8.6 +	57.3
0002	OR 889087	2	HWW	61.5	60	10.7 +	63.9 -	28.1	0.38 -	79.3 -	9.3 +	57.5
0003	OR 890171	3	HWW	64.3 +	62	10.0	63.1 -2	26.2	0.36 -	79.5 -	8.6 +	57.5
0004	OR 890188	4	HWW	58.1 -	66	9.2	64.8	28.7	0.34	82.3	7.4	57.4
0005	OR 890201	5	HWW	62.9	60	11.3 +	67.4 +	28.2	0.38 -	82.9	9.5 +	59.3 +
0006	OR 860471	6	HWW	63.1	61	9.8	66.1	30.7	0.31 +	85.2	8.1	58.5 +
0007	OR 900182	7	HWW	62.4	64	11.2 +	63.1 -2	24.0	0.36 -	79.5 -	8.9 +	57.3
0008	OR 900191	8	SWW	60.8	47	10.3 +	61.6 -2	28.2	0.41 -2	75.3 -2	8.5	59.4 +
0009	OR 900229	9	HWW	63.6 +	73	10.5 +	64.5 -	24.7	0.34	82.0	8.6 +	58.4 +
0010	OR 900349	10	HWW	62.9	69	10.2 +	64.9	26.3	0.38 -	80.3 -	8.7 +	58.4 +
0011	OR 900357	11	SWW	60.6	38	8.7	65.6	35.8	0.34	83.1	6.7	56.7
0012	OR 900379	12	HWW	62.6	79	9.3	63.5 -	24.2	0.42 -2	76.8 -2	7.2	57.3
0013	OR 900414	13	HWW	60.2	68	6.9 -	67.3 +	31.6	0.45 -2	79.2 -	5.7 -	53.4
0014	OR 900415	14	SWW	59.1 -	33	7.4	64.2 -	37.7	0.35	80.6 -	6.7	55.4
0015	OR 900423	15	SWW	60.5	48	8.2	62.8 -2	32.1	0.38 -	76.9 -2	7.2	53.9
0016	OR 900474	16	HWW	63.8 +	69	9.2	67.4 +	27.7	0.36 -	84.0	8.3	56.2
0017	OR 900479	17	HWW	64.2 +	60	8.7	61.3 -2	24.9	0.41 -2	75.0 -2	7.2	54.9
0018	OR 902329	18	HWW	62.5	65	8.3	64.4 -	29.5	0.38 -	79.8 -	6.3	57.3
0019	OR 908305	19	HWW	65.1 +2	53	10.7 +	64.8	23.4	0.41 -2	78.6 -2	8.9 +	58.2 +
0020	OR 908307	20	HWW	65.5 +2	80	10.1	64.4 -	22.5	0.37 -	80.3 -	8.3	58.4 +
0021	OR 908381	21	HWW	60.6	55	9.8	68.6 +2	33.3	0.37 -	84.7	8.1	55.0
0022	OR 908426	22	SWW	62.4	44	10.0	68.0 +2	29.5	0.45 -2	79.0 -	8.3	57.4
0023	OR 908455	23	HWW	62.7	51	10.3 +	64.0 -	26.9	0.39 -2	78.9 -2	8.3	57.0
0024	OR 908456	24	HWW	61.2	63	8.1	64.5 -	29.6	0.37 -	80.4 -	6.6	56.5
0025	OR 908457	25	HWW	63.5 +	58	8.6	65.1	28.5	0.37 -	81.1	7.1	55.0
0026	OR 908488	26	HWW	64.6 +	70	8.8	62.5 -2	24.7	0.38 -	77.8 -2	7.5	56.4
0027	OR 908501	27	HWW	62.8	62	10.1	63.0 -2	24.3	0.45 -2	74.7 -2	8.2	58.4 +
0028	OR 880223	28	HWW	60.6	55	7.9	65.2	31.8	0.38 -	80.6 -	6.6	54.4
*0029	WANSER	29	HRW	61.4	55	8.6	65.7	34.5	0.34	83.2	7.2	55.3

* = standard mean nursery flour protein = 7.8 mill used = Quad

Standard Mean
Nursery Mean
Nursery Standard deviation

Standard Mean
Nursery Mean
Nursery Standard deviation

HRW	61.4	55	8.6	65.7	34.5	0.34	83.2	7.2	55.3
HWW	62.4	62	9.5	64.6	27.7	0.38	79.9	7.9	57.0
HWW	1.76	9.3	1.09	1.81	3.30	0.033	2.86	1.00	1.54
HRW	61.4	55	8.6	65.7	34.5	0.34	83.2	7.2	55.3
SWW	60.7	42	8.5	65.0	33.1	0.39	78.8	7.4	55.6
SWW	1.66	7.8	1.33	2.69	4.19	0.051	1.86	0.82	1.76

SAMPLE#	BREEDER#	MTYPE	CODI	TGS	BABS	MTIME	LVOL	BCRGR	PROQ	RVA	COLOR*
0001	1	4M	8.52	6						211	Q
0002	2	4M	8.54	5	62.7	3.1	795 +2	7	+1	203	Q
0003	3	6L	8.48	5						103	
0004	4	5M	8.45	5						64	
0005	5	2H	8.36	5	62.5	2.3 -	795 +2	6	+1	170	U
0006	6	3M	8.85	6						164	S
0007	7	6M	8.21	5	63.0	4.5	705	8	0	73	
0008	8	6L	8.51	6						118	
0009	9	4M	8.31	4						142	
0010	10	5M	8.31	4						139	
0011	11	3L	8.79	5						165	S
0012	12	3M	8.27	5						170	S
0013	13	2L	8.47	7 +						87	
0014	14	2L	8.66	7 +						124	
0015	15	2L	8.59	7 +						94	
0016	16	4M	8.40	7 +	62.4	2.6	730	9	+1	134	
0017	17	2M	8.59	7 +						231	S
0018	18	4L	8.32	6						81	
0019	19	4M	8.29	5	62.4	2.9	770 +	8	+1	151	Q
0020	20	6M	8.16	5	65.6 +	2.6	810 +2	8	+1	64	
0021	21	3M	8.52	6						105	
0022	22	4M	8.15	6						87	
0023	23	4M	8.55	5						128	
0024	24	4L	8.49	5						78	
0025	25	2M	8.41	6						129	
0026	26	3M	8.31	6						179	Q
0027	27	2H	8.19	5	63.6	2.5	715	9	+1	185	Q
0028	28	3L	8.19	6						97	
*0029	29	4L	8.60	5	61.5	3.7	710	8	+1	74	

* = standard mean nursery flour protein = 7.8 mill used = Quad

HRW	8.60	5	61.5	3.7	710	8	74
HWW	8.42	5	63.2	2.9	760	8	135
HWW	0.174	0.8	1.15	0.74	42.8	1.1	47.7
HRW	8.60	5	61.5	3.7	710	8	74
SWW	8.47	7					102
SWW	0.276	0.6					19.7

COMMENTS: Quality parameters of HWW and SWW selections in this nursery were graded by comparison to the standard mean of Wanser. Breeder #'s 8, 11, 14, 15 and 22 had NIR wheat hardness value less than 50 and were classified as SWW. A milling tempering error occurred on Breeder #'s 11, 13, 14 and 15. Breeder #13 was tempered to 13.0% moisture instead of 14.5%. Breeder #'s 11, 14, and 15 were tempered to 14.5% moisture instead of 13.0%. This would have influenced flour yield, ash and milling score to some degree. Cookies were baked on all lines. Wheat and flour protein content of all lines were very low (mean nursery flour protein content - 7.8%). HWW lines with this level of flour protein, do not have adequate properties for good bread type wheats. All lines had poor mixogram type (inadequate bread type) i.e., low water absorption, very weak mixing and gluten strength properties. Wanser and Breeder #'s 2, 5, 7, 16, 19, 20 and 27 were selected for bread baking since they exhibited the stronger types (even though all were considered poor to questionable). All lines bread baked had loaf volume equal to or exceeding that expected for their flour protein content as graded by their Protein Quality (PROQ) rating, however bread crumb grain was poor for nearly all lines. It is difficult and almost useless to assess bread quality on bread type wheats with such low protein content. We recommend a minimum of 12.0% wheat protein and 10.5% flour protein content for bread baking types.

Rapid Visco Analyzer (RVA) viscosity was run on all lines. RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable.

Alkaline flour color (COLOR) score was determined on a few lines. *Color represents an extremely important quality criterion in Asian types of noodles. A preliminary alkaline flour color test was initiated. An alkaline Pekar slick was used to subjectively measure flour color. The Pekar slick was prepared by pressing flour to a smooth surface, immersing in a 1.0% alkaline solution consisting of 60% K₂CO₃ and 40% Na₂CO₃ for 2 minutes. The sample rested at a room temperature of (77°F) for 4 hours before visual observation and scoring. Flours were scored by the following; S = satisfactory, Q = questionable, and U = unsatisfactory. Desirable flour color ranges from bright white through creamy yellow to bright yellow. Any dullness, brown, or greenish casts would be unacceptable. Alkaline flour color (COLOR) is scored only on SWW, HWW, SWS and HWS wheats which have a minimum RVA viscosity of 150 and a minimum NIR wheat hardness (UWHRD) value of 40.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0001	OR 910017	1	SWW	58.5	34	11.0	69.6	35.6	0.40	84.3	8.9	54.3
0002	OR 910023	2	SRW	58.0	46	12.3	66.5	32.0	0.41	79.7	9.6	55.7
0003	OR 910039	3	SWW	59.7	28	11.2	67.9	37.9	0.38	83.4	8.9	54.4
0004	OR 910041	4	SWW	59.8	32	10.6	70.2	37.6	0.40	85.0	8.3	53.8
0005	OR 910042	5	SWW	56.4	28	11.0	67.9	38.9	0.42	80.8	8.7	54.0
0006	OR 910043	6	SWW	59.8	33	10.2	68.9	38.0	0.38	84.6	8.1	52.1
0007	OR 910047	7	SWW	60.5	30	9.1	68.3	37.8	0.38	83.9	6.9	52.6
0008	OR 910059	8	SWW	59.4	31	9.5	69.5	34.0	0.38	85.4	7.7	52.1
0009	OR 910105	9	SWW	56.9	41	10.2	68.2	35.8	0.36	85.0	7.9	52.4
0010	OR 910162	10	HWW	60.3	58	10.4	67.7	33.1	0.37	83.8	8.0	53.3
0011	OR 910163	11	SWW	60.4	48	10.0	69.1	35.3	0.41	83.0	8.1	52.1
0012	OR 910195	12	HWW	62.5	62	9.9	61.2	24.3	0.39	75.9	8.2	55.3
0013	OR 910221	13	HWW	62.0	54	8.6	62.2	28.4	0.37	78.0	7.0	53.5
0014	OR 910314	14	HWW	60.3	63	10.4	64.7	27.4	0.37	80.6	8.6	54.3
0015	OR 910332	15	HWW	60.3	70	10.7	64.4	24.8	0.38	79.8	8.6	55.3
0016	OR 910333	16	HWW	62.3	65	11.2	62.8	22.9	0.39	77.6	9.0	55.5
0017	OR 910341	17	HWW	61.7	72	11.4	65.5	27.1	0.34	83.0	9.6	56.5
0018	OR 910353	18	HWW	61.0	64	11.5	65.2	27.0	0.39	80.1	9.6	56.3
0019	OR 910361	19	SWW	60.0	46	11.9	67.7	33.9	0.38	83.1	9.8	53.8
0020	OR 910394	20	SWW	58.2	27	10.9	69.3	39.4	0.39	84.5	8.8	52.9

* = standard mean nursery flour protein = 8.5 mill used = Quad

SAMPLE#	BREEDER#	MTYPE	CODI	TGS	BABS	MTIME	LVOL	BCRGR	PROQ	RVA	COLOR*
0001	1	2L	9.34	8						150	
0002	2	4M	8.84	6						73	
0003	3	2M	8.77	7						101	
0004	4	2M	9.15	8						129	
0005	5	2L	9.00	7						156	
0006	6	2L	9.05	7						52	
0007	7	2L	8.89	7						163	
0008	8	2L	9.11	7						180	
0009	9	2M	8.61	6						145	Q
0010	10	2L	8.77	5						145	S
0011	11	2L	8.49	7						146	S
0012	12	1M	8.15	5						131	
0013	13	2L	8.15	6						63	
0014	14	3M	8.48	6	57.5	2.2	670	8	-1	119	
0015	15	3M	8.24	6	61.0	2.9	705	8	0	63	
0016	16	3M	8.06	5	61.2	2.3	675	9	-1	77	
0017	17	2M	8.45	6						114	
0018	18	3M	8.30	5	62.0	3.1	765	7	0	131	
0019	19	4M	8.35	6	57.5	3.6	895	5	+1	152	Q
0020	20	2M	9.25	8						65	

* = standard mean nursery flour protein = 8.5 mill used = Quad

COMMENTS: Quality parameters of SWW and HWW selections in this nursery were not graded by comparison to a standard mean, since no check variety was included for this purpose. Several selections had NIR wheat hardness value less than 50 and were classified as SWW. Breeder #2 had a red seed coat and was classified SRW. All other selections in the nursery were classified as HWW (NIR wheat hardness ≥ 50). The mean nursery flour protein content was 8.5%. Cookies were baked on all lines. Bread was baked on five lines (most were HWW), which had the stronger mixing properties as shown by the mixogram. Mixograms of those baked lines were considered questionable for bread-type wheats, however, this was due to their rather low flour protein content. Loaf volume of three of these lines were equal to or exceeded that expected for their flour protein content as graded by their Protein Quality (PROQ) rating. All of the lines bread baked had poor or questionable bread crumb grain. Rapid Visco Analyzer (RVA) viscosity was determined on all lines. RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable.

Alkaline flour color (COLOR) was scored only on those SWW and HWW lines which had a RVA near or above 150 and a NIR wheat hardness value near 40 or higher. *Color represents an extremely important quality criterion in Asian types of noodles. A preliminary alkaline flour color test was initiated. An alkaline Pekar slick was used to subjectively measure flour color. The Pekar slick was prepared by pressing flour to a smooth surface, immersing in a 1.0% alkaline solution consisting of 60% K₂CO₃ and 40% Na₂CO₃ for 2 minutes. The sample rested at a room temperature of (77°F) for 4 hours before visual observation and scoring. Flours were scored by the following; S = satisfactory, Q = questionable, and U = unsatisfactory. Desirable flour color ranges from bright white through creamy yellow to bright yellow. Any dullness, brown, or greenish casts would be unacceptable. Alkaline flour color (COLOR) is scored only on SWW, HWW, SWS and HWS wheats which have a minimum RVA viscosity of 150 and a minimum NIR wheat hardness (UWHRD) value of 40.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	HSCOR	FPROT	MABS
0001	STEPHENS	1	SWW	59.6	37	10.0	71.1 -2	15.0	0.36 +2	78.7 -	8.3	52.4
0002	GENE	2	SWW	59.5	37	11.0	69.0 -2	14.8	0.40	73.0 -2	8.7	54.2
0003	OR8400814H	3	SWW	61.2	34	10.4	68.6 -2	17.4	0.35 +2	75.5 -2	8.4	54.3
0004	OR8500933H	4	SWW	59.1	24	10.6	69.3 -2	14.4	0.40	74.1 -2	8.2	54.2
0005	OR8501048P	5	SWW	59.2	45	10.2	66.3 -2	14.7	0.39 +	69.4 -2	7.9	55.3
0006	OR860302	6	SWW	61.3	33	11.1	69.0 -2	14.8	0.39 +	72.3 -2	8.7	54.3
0007	OR860303	7	SWW	61.3	45	11.1	69.1 -2	15.4	0.40	71.4 -2	8.8	53.9
0008	OR 870012	8	SWW	59.7	31	9.6	70.9 -2	18.0	0.37 +	78.5 -	7.5	54.4
0009	OR 870025	9	SWW	58.6 -	27	10.3	72.5 -	18.6	0.37 +	82.8	8.1	53.6
0010	OR 870082	10	SWW	61.2	31	10.4	68.0 -2	14.6	0.41	72.2 -2	8.2	52.6
0011	OR 870303	11	SWW	58.4 -	34	10.2	71.4 -2	17.5	0.37 +	78.2 -	7.9	52.8
0012	OR 870337	12	SWW	60.8	34	11.0	72.9	17.7	0.39 +	82.9	8.6	52.3
0013	OR 870831	13	SWW	61.5	39	10.9	70.5 -2	13.9	0.44 -	74.9 -2	8.7	51.3 +
0014	OR 880172	14	SWW	60.7	29	10.5	71.3 -2	18.0	0.38 +	79.9	8.0	52.7
0015	OR 880525	15	SWW	61.5	38	10.1	72.4 -	17.6	0.38 +	82.4	7.9	52.6
0016	OR 870502	16	SWW	60.4	32	10.1	69.5 -2	12.5	0.45 -	72.4 -2	8.0	53.6
0017	OR 880555	17	SWW	60.3	46	10.3	71.2 -2	15.9	0.38 +	79.4 -	8.2	53.0
0018	OR 890061	18	SWW	60.5	38	8.9	71.7 -	16.0	0.39 +	77.6 -	7.8	54.0
0019	OR 890253	19	SWW	62.4 +	32	9.6	70.0 -2	14.4	0.39 +	75.4 -2	8.0	54.5
0020	OR 898110	20	SWW	59.7	37	9.8	72.0 -	17.7	0.39 +	80.0	7.4	53.7
0021	OR 898120	21	SWW	61.1	41	10.2	70.6 -2	14.5	0.44 -	74.8 -2	7.9	54.6
0022	OR 898200	22	SWW	61.1	33	9.9	71.9 -	15.2	0.38 +	79.4 -	7.9	53.3
0023	OR 898400	23	SWW	60.6	42	10.5	71.1 -2	14.6	0.40	78.3 -	8.5	55.3
*0024	HILL 81	24	SWW	60.3	29	9.8	73.7	18.1	0.41	81.6	7.8	54.6

* = standard mean nursery flour protein = 8.1 mill used = Buhler

Standard Mean	SWW	60.3	29	9.8	73.7	18.1	0.41	81.6	7.8	54.6
Nursery Mean	SWW	60.4	35	10.3	70.6	15.9	0.39	76.9	8.1	53.6
Nursery Standard deviation	SWW	1.01	5.8	0.54	1.73	1.69	0.024	3.90	0.38	1.01

SAMPLE#	BREEDER#	MTYPE	CODI	TGS	CAVOL	SCSCOR	RVA	COLOR*
0001	1	3M	8.30	6	1235	64 -	169	S
0002	2	5L	8.29	6	1255	71	148	Q
0003	3	3L	8.43	6	1270	76 +	186	
0004	4	3L	8.20	6	1275	71	157	
0005	5	3L	8.15 -	6	1190 -	64 -	70	U
0006	6	2M	8.32	6	1250	68	118	
0007	7	2M	7.96 -	6	1235	70	122	U
0008	8	2L	8.38	6	1260	69	149	
0009	9	3L	8.34	6	1280	73	143	
0010	10	1L	8.40	6	1325 +2	76 +	127	
0011	11	3L	8.09 -	5 -	1310 +	72	121	
0012	12	3M	8.43	7	1285 +	73	194	
0013	13	2M	8.05 -	6	1230	71	141	U
0014	14	4L	8.41	4 -2	1235	70	50	
0015	15	2L	8.39	6	1235	70	114	Q
0016	16	2L	8.02 -	5 -	1245	71	161	
0017	17	2L	8.29	6	1275	72	168	S
0018	18	2L	7.96 -	4 -2	1210	64 -	59	S
0019	19	2L	7.93 -	4 -2	1240	70	59	
0020	20	2L	8.40	6	1315 +	73	86	Q
0021	21	3L	7.85 -2	6	1210	67	106	S
0022	22	2L	8.12 -	6	1275	73	142	
0023	23	4L	7.84 -2	6	1205	67	144	S
*0024	24	2L	8.44	7	1240	70	85	

* = standard mean nursery flour protein = 8.1 mill used = Buhler

SWW	8.44	7	1240	70	85
SWW	8.21	6	1254	70	126
SWW	0.201	0.8	34.9	3.3	40.6

COMMENTS: Quality parameters of SWW selections in this nursery were graded by comparison to the standard mean of Hill 81. Cookies and Japanese sponge cakes were baked on all lines. Rapid Visco Analyzer (RVA) viscosity was determined on all lines. RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable. Alkaline flour color (COLOR) was scored on all lines which had a NIR wheat hardness value of 37 or higher. Most of these lines color tested, had RVA viscosity less than 150. *Color represents an extremely important quality criterion in Asian types of noodles. A preliminary alkaline flour color test was initiated. An alkaline Pekar slick was used to subjectively measure flour color. The Pekar slick was prepared by pressing flour to a smooth surface, immersing in a 1.0% alkaline solution consisting of 60% K₂CO₃ and 40% Na₂CO₃ for 2 minutes. The sample rested at a room temperature of (77°F) for 4 hours before visual observation and scoring. Flours were scored by the following; S = satisfactory, Q = questionable, and U = unsatisfactory. Desirable flour color ranges from bright white through creamy yellow to bright yellow. Any dullness, brown, or greenish casts would be unacceptable. Alkaline flour color (COLOR) is scored only on SWW, HWW, SWS and HWS wheats which have a minimum RVA viscosity of 150 and a minimum NIR wheat hardness (UWHRD) value of 40.

SAMPLE#	BREEDER#	MTYPE	COOI	TGS	RVA	COLOR*
0001	1	2M	9.02	7	99	
0002	2	3M	8.39 -	3 -2	148	Q
0003	3	2M	8.80	5 -2	117	
0004	4	3L	8.70	7	48	
0005	5	2L	9.31 +	8	104	
0006	6	3L	8.86	7	132	
*0007	7	3L	8.91	8	138	
0008	8	1L	8.85	7	167	S

* = standard mean nursery flour protein = 8.3 mill used = Quad

SWW	8.91	8	138
SWW	8.92	7	115
SWW	0.197	1.0	37.4
SWW	8.91	8	138
HWW	8.39	3	148
HWW			

COMMENTS: Quality parameters of SWW and HWW selections in this nursery were graded by comparison to the standard mean of Stephens. Breeder #2 had NIR wheat hardness value above 50 and was classified as HWW. Breeder #'s 5, 6 and 8 had exceptionally higher flour yield than the standard mean. Breeder #'s 5 and 8 had exceptionally good milling score. Cookies were baked on all lines. Breeder #5 had cookie diameter significantly larger than the standard mean. Rapid Visco Analyzer (RVA) viscosity was determined on all lines. RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable. Alkaline flour color (COLOR) was scored on Breeder #'s 2 and 8. *Color represents an extremely important quality criterion in Asian types of noodles. A preliminary alkaline flour color test was initiated. An alkaline Pekar slick was used to subjectively measure flour color. The Pekar slick was prepared by pressing flour to a smooth surface, immersing in a 1.0% alkaline solution consisting of 60% K₂CO₃ and 40% Na₂CO₃ for 2 minutes. The sample rested at a room temperature of (77°F) for 4 hours before visual observation and scoring. Flours were scored by the following; S = satisfactory, Q = questionable, and U = unsatisfactory. Desirable flour color ranges from bright white through creamy yellow to bright yellow. Any dullness, brown, or greenish casts would be unacceptable. Alkaline flour color (COLOR) is scored only on SWW, HWW, SWS and HWS wheats which have a minimum RVA viscosity of 150 and a minimum NIR wheat hardness (UWHRD) value of 40.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	NABS
*0001	STEPHENS	1	SWW	60.2	37	9.8	69.5	36.2	0.42	82.9	8.1	53.6
0002	OR 870534	2	SWW	61.0	24	9.3	67.9	36.4	0.41	81.5	7.4	52.6
0003	OR 880363	3	SWW	62.7 +	45	10.0	65.3 -2	29.7	0.44	76.2 -2	8.0	52.8
0004	OR 880447	4	SWW	61.4	33	9.3	69.0 -	38.9	0.42	82.2	7.5	
0005	OR 890077	5	SWW	62.9 +	29	10.1	66.4 -2	33.4	0.42	78.9 -2	8.1	
0006	OR 890078	6	SWW	62.4 +	38	10.3	68.0 -2	33.6	0.43	80.3 -	8.0	53.4
0007	OR 890088	7	SWW	60.4	32	9.3	68.8 -	38.1	0.40 +	83.2	6.9	52.6
0008	OR 890254	8	SWW	62.7 +	43	9.5	64.5 -2	31.9	0.42	76.5 -2	7.6	
0009	OR 890255	9	HWW	62.9 +	83	10.3	60.5 -2	21.4	0.45 -	72.1 -2	7.8	
0010	OR 898590	10	SWW	60.5	37	9.3	68.7 -	36.6	0.42	81.8	7.7	53.6
0011	OR 900081	11	SWW	61.0	35	8.9	69.7	37.4	0.43	82.5	6.7	52.4
0012	OR 900082	12	SWW	61.3	30	8.3	69.5	38.0	0.44	81.6 -	6.7	52.1
0013	OR 900096	13	SWW	60.2	31	7.8 +	69.4	37.8	0.41	83.4	6.5 +	52.6
0014	OR 900099	14	SWW	60.3	34	7.9 +	69.2 -	35.8	0.41	83.1	6.4 +	52.6
0015	OR 900405	15	SWW	60.4	29	9.1	70.0	39.9	0.40 +	84.8	7.4	52.8
0016	OR 900542	16	SWW	60.7	35	8.0 +	70.6	39.3	0.42	84.3	6.5	52.6
0017	OR 908309	17	SWW	60.1	31	8.4	70.6	39.5	0.40 +	85.5	7.0	52.6
0018	OR 908310	18	SWW	60.7	28	7.7 +	70.8	40.3	0.40 +	85.8	6.5	52.6
0019	OR 908312	19	SWW	59.0	20	8.1 +	70.6	40.7	0.42	84.3	6.6	52.6
0020	OR 908314	20	SWW	61.0	29	8.2 +	71.4	39.5	0.40 +	86.6 +	6.8	52.6
0021	OR 908317	21	SWW	62.2 +	30	7.9 +	70.3	38.5	0.41	84.5	6.5	52.8
0022	OR 908321	22	SWW	61.0	25	8.3	71.6 +	40.2	0.42	85.5	6.8	52.8
0023	OR 908332	23	SWW	60.6	25	8.5	70.8	40.4	0.36 +2	88.3 +2	6.7	52.6
0024	OR 908334	24	SWW	60.8	27	8.5	70.7	39.2	0.38 +2	86.9 +	6.9	52.6
0025	OR 908335	25	SWW	60.1	32	8.7	69.4	38.2	0.36 +2	86.6 +	6.9	52.6
0026	OR 908338	26	SWW	60.7	40	8.4	69.2 -	37.0	0.38 +2	85.0	6.8	53.6
0027	OR 908341	27	SWW	61.8	36	8.6	69.8 -	37.3	0.37 +2	86.4 +	6.9	52.2
0028	OR 908348	28	SWW	61.5	35	8.5	67.7 -2	37.2	0.36 +2	84.4	6.8	52.8
0029	OR 908363	29	SWW	60.4	40	8.1 +	68.8 -	36.6	0.42	82.0	6.6	52.8
0030	OR 908364	30	SWW	60.5	28	8.6	70.6	39.9	0.40 +	85.5	6.9	52.6
0031	OR 908368	31	SWW	61.7	28	9.4	71.4	39.3	0.42	85.3	7.7	53.4
0032	OR 908369	32	SWW	62.0	30	9.1	72.0 +	39.5	0.41	86.7 +	7.3	53.6
0033	OR 908376	33	SWW	61.8	33	8.6	69.1 -	40.6	0.42	82.4	6.9	52.7
0034	OR 908377	34	SWW	62.2 +	28	8.2 +	70.7	41.5	0.38 +2	86.9 +	6.7	52.8
0035	OR 908386	35	SWW	60.2	36	9.4	69.6	38.7	0.44	81.7 -	7.5	53.8
0036	OR 908387	36	SWW	60.4	34	8.6	71.0	41.2	0.37 +2	88.0 +	6.9	52.8
0037	OR 908388	37	SWW	60.2	26	8.9	69.9	39.7	0.40 +	84.6	7.1	52.7
0038	OR 908389	38	SWW	61.2	31	8.4	70.6	41.3	0.40 +	85.5	6.9	53.8
0039	OR 908393	39	SWW	60.3	36	9.7	70.5	39.9	0.41	84.8	7.7	52.8
0040	OR 908394	40	SWW	61.3	27	8.6	71.0	41.3	0.38 +2	87.3 +	7.2	52.8

* = standard mean nursery flour protein = 7.2 mill used = Quad

YEAR 92	NURSERY 061	SOFT WHEAT REPLICATED ADVANCE	Q	CORVALLIS, OR	W.E. KRONSTAD	CONT. PAGE 1
SAMPLE#	BREEDER#	MTYPE	CODI	TGS	RVA	COLOR*
*0001	1	2M	9.20	7	150	S
0002	2	2M	9.46 +	7	55	
0003	3					
0004	4	5L	9.20	7	115	
0005	5					
0006	6	2M	8.76 -	6	96	
0007	7	2L	8.95	7	117	
0008	8					
0009	9					
0010	10	2M	9.04	7	144	
0011	11	2L	8.84 -	7	146	
0012	12	1L	9.11	7	153	
0013	13	1L	9.20	7	139	
0014	14	1L	8.85 -	7	145	
0015	15	3M	9.31	6	124	
0016	16	1L	9.50 +	9 +	131	
0017	17	5L	9.22	8	124	
0018	18	4L	9.21	8	99	
0019	19	4L	9.35	8	119	
0020	20	4L	9.14	7	126	
0021	21	2L	8.94	7	75	
0022	22	2L	8.90	7	62	
0023	23	4L	9.27	7	165	
0024	24	4L	8.95	6	184	
0025	25	3L	9.43 +	8	120	
0026	26	2L	9.07	7	184	S
0027	27	3L	9.02	7	138	
0028	28	2L	9.00	7	49	
0029	29	2L	8.73 -	6	67	
0030	30	2L	8.90	7	104	
0031	31	2M	8.90	7	125	
0032	32	2L	8.91	7	130	
0033	33	2L	9.48 +	9 +	85	
0034	34	2L	9.18	8	25	
0035	35	3L	9.25	7	110	
0036	36	2L	9.40	8	124	
0037	37	3L	9.14	7	142	
0038	38	2L	9.06	7	125	
0039	39	2M	9.02	7	119	
0040	40	2L	9.12	8	145	

* = standard mean nursery flour protein = 7.2 mill used = Quad

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0041	OR 908395	41	SWW	61.0 +	34	8.2 +	71.3	39.8	0.40 +	86.4 +	6.5	52.6
0042	OR 908400	42	SWW	63.5 +	47	8.9	69.9	36.3	0.39 +	85.3	6.9	52.4
0043	OR 908405	43	SWW	61.2	37	8.0 +	69.9	36.7	0.41	84.0	6.5	52.4
0044	OR 908406	44	SWW	61.5	24	7.9 +	69.4	38.7	0.41	83.4	6.5	52.6
0045	OR 908414	45	SWW	60.4	27	8.4	68.0 -2	39.4	0.41	81.6 -	6.8	52.7
0046	OR 908415	46	SWW	60.9	25	8.4	68.2 -2	38.7	0.42	81.2 -	6.9	52.8
0047	OR 908430	47	SRW	61.4	29	8.2 +	69.4	38.8	0.39 +	84.6	6.6	52.8
0048	OR 908434	48	SWW	62.0 +	43	9.3	70.1	34.4	0.42	83.6	7.3	52.8
0049	OR 908437	49	SWW	63.0 +	42	9.6	69.2 -	36.5	0.40 +	83.8	7.2	52.4
0050	OR 908438	50	SWW	62.5 +	27	9.1	68.7 -	38.8	0.45 -	79.9 -	7.7	52.8
0051	OR 908440	51	SWW	60.2	33	7.8 +	68.3 -	38.4	0.41	82.0	6.3 +	52.6
0052	OR 908449	52	SWW	61.2	41	7.5 +	70.4	38.3	0.40 +	85.3	6.1 +	52.6
0053	OR 908450	53	SWW	61.7	39	7.3 +	70.8	38.5	0.41	85.2	6.1 +	52.4
0054	OR 908451	54	SWW	60.7	33	7.2 +	69.7	40.2	0.40 +	84.4	5.9 +	52.6
0055	OR 908452	55	SWW	60.6	23	7.3 +	68.1 -2	39.4	0.41	81.7 -	6.0 +	52.8
0056	OR 908468	56	SWW	62.0	23	9.0	69.1 -	38.1	0.37 +2	85.5	6.8	52.8
0057	OR 908473	57	SWW	60.4	31	7.7 +	69.4	38.2	0.40 +	84.0	6.2 +	52.8
0058	OR 908478	58	SWW	62.9 +	42	8.5	71.2	38.1	0.40 +	86.3 +	6.9	52.8
0059	OR 908479	59	SWW	61.5	39	8.1 +	69.8	40.4	0.39 +	85.2	6.2 +	52.8
0060	OR 908481	60	SWW	63.8 +2	41	9.4	68.0 -2	32.8	0.42	81.0 -	7.8	53.6
0061	OR 908482	61	HWW	63.9 +2	59	9.8	66.9 -2	29.9	0.38 +2	82.4	8.4	55.0
0062	OR 908483	62	SWW	63.4 +	45	10.3	66.0 -2	31.0	0.45 -	76.5 -2	9.0 -	
0063	OR 908484	63	HWW	61.3	34	11.1	64.5 -2	37.9	0.42	76.5 -2	9.3 -	
0064	OR 908485	64	SWW	63.2 +	35	10.3	64.9 -2	31.5	0.44	75.7 -2	8.6	
0065	OR 908486	65	SWW	64.6 +2	34	10.5	65.3 -2	34.5	0.39 +	79.4 -2	8.8	
*0066	STEPHENS	66	SWW	60.3	21	9.7	70.2	36.2	0.42	83.8	7.4	53.1
0067	OR 900098	67	SWW	60.3	30	8.4	70.8	38.5	0.40 +	85.8	6.6	52.1
0068	OR 900190	68	HWW	61.3	63	9.8	63.0 -2	27.6	0.41	76.8 -2	7.9	
0069	OR 900192	69	SWW	61.3	47	10.2	65.4 -2	30.7	0.47 -2	74.5 -2	8.2	
0070	OR 900302	70	SWW	63.0 +	36	10.1	67.9 -2	34.1	0.40 +	82.1	7.6	53.6
0071	OR 900381	71	HWW	63.8 +2	56	9.3	67.0 -2	31.1	0.36 +2	83.6	6.9	54.6
0072	OR 908323	72	SWW	62.2 +	32	9.8	72.7 +2	38.9	0.41	87.6 +	7.7	53.1
0073	OR 908351	73	SWW	60.9	44	9.9	69.4	36.4	0.45 -	80.8 -	8.0	53.3
0074	OR 908360	74	SWW	61.2	28	10.4	71.4	36.6	0.47 -2	82.1	8.0	53.2
0075	OR 908361	75	SWW	60.7	31	10.1	72.2 +	38.0	0.46 -	83.8	7.9	52.0
0076	OR 908385	76	SWW	60.6	47	10.4	70.7	35.8	0.43	83.8	8.6	53.0
0077	OR 908410	77	HWW	61.9	58	9.3	67.8 -2	32.0	0.35 +2	84.9	7.9	54.1
0078	OR 908419	78	SWW	62.9 +	33	9.7	71.6 +	39.3	0.41	86.2 +	7.9	52.2
0079	OR 908446	79	SWW	61.0	19	9.8	70.3	35.9	0.47 -2	80.7 -	7.9	53.4
*0080	STEPHENS	80	SWW	60.5	30	9.7	71.6	36.9	0.43	84.9	8.0	53.0

* = standard mean nursery flour protein = 7.2 mill used = Quad

Standard Mean	SWW	60.3	70.4	36.4	0.42	83.9	7.8	53.2
Nursery Mean	SWW	61.3	69.4	37.7	0.41	83.3	7.2	52.8
Nursery Standard deviation	SWW	1.07	1.85	2.65	0.024	3.05	0.74	0.42
Standard Mean	SWW	60.3	70.4	36.4	0.42	83.9	7.8	53.2
Nursery Mean	HWW	62.8	65.0	28.4	0.39	80.0	7.8	54.6
Nursery Standard deviation	HWW	1.15	3.15	4.25	0.041	5.37	0.54	0.45
Standard Mean	SWW	60.3	70.4	36.4	0.42	83.9	7.8	53.2
Nursery Mean	SRW	61.4	69.4	38.8	0.39	84.6	6.6	52.6
Nursery Standard deviation	SRW							

SAMPLE#	BREEDER#	MTYPE	CODI	TGS	RVA	COLOR*
0041	41	2L	9.14	8	159	U
0042	42	2L	8.94	8	154	
0043	43	3L	9.19	8	89	
0044	44	2L	8.88	7	55	
0045	45	1L	9.15	8	28	S
0046	46	1L	9.04	8	30	
0047	47	2L	9.18	8	78	
0048	48	2M	8.69	7	135	
0049	49	4L	9.18	8	164	S
0050	50	2M	8.90	7	123	
0051	51	1L	9.00	8	144	
0052	52	1L	9.09	7	128	
0053	53	1L	9.32	8	141	S
0054	54	1L	9.16	7	115	
0055	55	1L	9.30	8	63	
0056	56	4L	9.04	7	45	
0057	57	3L	9.41 +	7	90	S
0058	58	2L	9.21	8	188	
0059	59	2L	9.24	8	159	
0060	60	2M	8.89	7	172	
0061	61	4M	8.48 -2	6	180	S
0062	62					
0063	63					
0064	64					
0065	65					
*0066	66	2M	8.92	7	141	
0067	67	2L	9.24	8	93	
0068	68					
0069	69					
0070	70	2L	8.76 -	7	95	
0071	71	3L	8.74 -	4 -2	97	
0072	72	2M	8.73 -	7	143	
0073	73	2M	8.98	7	130	
0074	74	2M	9.05	8	101	
0075	75	2M	8.81 -	7	132	
0076	76	2M	9.36	8	144	
0077	77	4M	8.86 -	7	149	S
0078	78	2M	9.05	7	63	
0079	79	2M	8.90	7	152	
*0080	80	2M	9.31	7	148	

* = standard	mean nursery flour protein = 7.2	mill used = Quad
SWW	9.14	146
SWW	9.09	118
SWW	0.201	39.2
SWW	9.14	146
HWW	8.69	142
HWW	0.194	41.9
SWW	9.14	146
SRW	9.18	78

COMMENTS: Quality parameters of SWW lines in this nursery were graded by comparison to the standard mean of Stephens. Breeder #'s 9, 61, 68, 71 and 77 had NIR wheat hardness value greater than 50 and were classified as HWW. Breeder #47 had red seed coat color and was classified as SRW. All lines were milled, however those with poor flour yield and/or milling score were excluded from further tests, i.e., mixogram, cookie, etc. These lines were Breeder #'s 3, 5, 8, 9, 62, 63, 64, 65, 68 and 69. Cookies were baked on all lines except those excluded for poor milling. No bread was baked on the HWW lines due to either poor milling properties, low flour protein content and/or weak dough mixing properties.

Rapid Visco Analyzer (RVA) viscosity was determined on all lines. RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable.

Alkaline flour color (COLOR) was scored only on those lines with a NIR wheat hardness value of near 40 or higher and having a minimum RVA viscosity of 150. *Color represents an extremely important quality criterion in Asian types of noodles. A preliminary alkaline flour color test was initiated. An alkaline Pekar slick was used to subjectively measure flour color. The Pekar slick was prepared by pressing flour to a smooth surface, immersing in a 1.0% alkaline solution consisting of 60% K₂CO₃ and 40% Na₂CO₃ for 2 minutes. The sample rested at a room temperature of (77°F) for 4 hours before visual observation and scoring. Flours were scored by the following; S = satisfactory, Q = questionable, and U = unsatisfactory. Desirable flour color ranges from bright white through creamy yellow to bright yellow. Any dullness, brown, or greenish casts would be unacceptable. Alkaline flour color (COLOR) is scored only on SWW, HWW, SWS and HWS wheats which have a minimum RVA viscosity of 150 and a minimum NIR wheat hardness (UWHRD) value of 40.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
*0001	STEPHENS	1	SWW	60.4	37	9.2	70.1	35.5	0.38	86.2	7.7	52.7
0002	OR 910379	2	SRW	57.7 -	23	10.3	66.4 -2	33.6	0.39	80.8 -2	8.5	53.1
0003	OR 910016	3	SWW	62.0	11	11.3 -	62.8 -2	36.8	0.37	77.5 -2	9.6 -	53.2
0004	OR 910022	4	SWW	56.3 -2	25	10.1	69.3	41.4	0.38	85.2	8.7	52.2
0005	OR 910048	5	SWW	61.3	26	10.2	64.8 -2	33.6	0.39	78.8 -2	8.8	53.7
0006	OR 910094	6	SWW	58.9	32	9.0	68.3 -	34.9	0.36	85.2	7.9	53.4
0007	OR 910096	7	SWW	60.8	35	10.6	69.7	38.2	0.37	86.3	8.7	53.5
0008	OR 910097	8	SWW	61.1	40	10.0	67.9 -	34.1	0.34 +	85.9	8.3	52.2
0009	OR 910107	9	SWW	57.9 -	20	9.5	68.7 -	37.7	0.40	83.1 -	7.8	53.6
0010	OR 910121	10	SWW	60.3	31	10.5	67.8 -2	39.6	0.40 -	82.0 -	8.9	53.8
0011	OR 910131	11	SWW	61.1	30	10.0	67.7 -2	37.0	0.34 +	85.7	8.2	52.8
0012	OR 910132	12	SWW	53.9 -2	22	10.9 -	67.6 -2	37.9	0.41 -	81.1 -2	8.8	53.1
0013	OR 910133	13	SWW	54.4 -2	27	10.3	67.5 -2	40.9	0.39	82.2 -	8.5	53.4
0014	OR 910135	14	SWW	59.2	33	9.6	68.0 -	36.4	0.41 -	81.6 -2	8.2	53.3
0015	OR 910146	15	SWW	59.1	26	10.9 -	65.4 -2	39.0	0.37	80.8 -2	9.3 -	53.4
0016	OR 910147	16	SWW	59.4	34	10.8 -	64.7 -2	38.5	0.35 +	81.2 -2	8.8	53.8
0017	OR 910149	17	SWW	57.9 -	34	10.0	68.3 -	42.5	0.39	83.2 -	8.5	52.6
0018	OR 910167	18	SWW	59.5	32	8.9	69.2	36.4	0.39	84.4	7.5	53.1
0019	OR 910168	19	SWW	60.0	31	8.6	69.4	36.9	0.40 -	84.0 -	7.4	52.9
0020	OR 910171	20	SWW	59.0	25	9.8	70.5	37.8	0.37	87.3	8.5	53.3
0021	OR 910172	21	SWW	59.2	34	10.4	69.0	35.3	0.40 -	83.5 -	8.9	53.6
0022	OR 910173	22	SWW	59.7	25	10.9 -	68.5 -	35.0	0.41 -	82.2 -	9.2 -	53.3
0023	OR 910174	23	SWW	60.1	36	10.5	69.2	35.6	0.38	85.0	9.1 -	53.8
0024	OR 910181	24	SWW	58.4 -	22	10.1	68.1 -	38.6	0.39	83.0 -	8.3	53.6
0025	OR 910182	25	SWW	60.5	35	8.9	67.9 -	38.1	0.35 +	85.3	8.2	53.7
0026	OR 910183	26	SWW	58.1 -	24	8.9	66.0 -2	37.9	0.40 -	79.7 -2	7.7	53.6
0027	OR 910193	27	SWW	60.5	25	8.0	71.0	43.3	0.38	87.3	7.1	52.7
0028	OR 910259	28	SWW	59.8	24	7.5 +	70.4	43.1	0.37	87.2	6.8	52.7
0029	OR 910286	29	HWW	62.7 +	57	10.0	64.7 -2	26.6	0.49 -2	74.4 -2	7.8	52.7
0030	OR 910288	30	SWW	61.8	46	10.2	65.6 -2	33.2	0.39	79.8 -2	8.9	54.7
0031	OR 910298	31	SWW	57.7 -	31	11.9 -	63.9 -2	31.0	0.47 -2	72.5 -2	10.1 -	55.1
0032	OR 910339	32	SWW	59.0	43	10.0	65.1 -2	31.3	0.41 -	77.9 -2	8.5	53.9
0033	OR 910363	33	SWW	59.0	23	9.8	70.4	40.3	0.39	85.9	8.6	53.7

* = standard
mean nursery flour protein = 8.4 mill used = Quad

Standard Mean
Nursery Mean
Nursery Standard deviation

Standard Mean
Nursery Mean
Nursery Standard deviation

Standard Mean
Nursery Mean
Nursery Standard deviation

SAMPLE#	BREEDER#	MTYPE	COOI	TGS	RVA	COLOR*
*0001	1	2L	9.29	8	161	S
0002	2	1L	8.88 -	7	272	
0003	3	3M	8.85 -	7	31	
0004	4	3L	9.36 -	8	121	
0005	5	4M	8.88 -	7	177	
0006	6	2L	8.96 -	7	168	
0007	7	2L	9.24 -	8	68	
0008	8	2L	8.91 -	7	131	
0009	9	4L	9.21 -	8	151	
0010	10	3M	9.16	7	143	
0011	11	2M	9.18	7	129	
0012	12	4L	9.05	8	169	
0013	13	3L	9.01 -	7	157	
0014	14	3L	9.31	9	154	
0015	15	3M	9.19	7	79	
0016	16	2L	8.93 -	7	211	
0017	17	2L	8.95 -	7	71	
0018	18	2L	8.91 -	8	176	
0019	19	2L	9.34	8	199	
0020	20	2L	9.00 -	7	124	
0021	21	2M	8.84 -	6 -	154	
0022	22	2M	8.80 -	6 -	63	Q
0023	23	3M	8.95 -	7	170	
0024	24	4L	8.89 -	7	171	
0025	25	4L	9.16	8	96	
0026	26	4L	8.99 -	8	154	
0027	27	5L	9.24	8	142	
0028	28	1L	9.16	8	156	
0029	29	3M	8.41 -2	6 -	52	
0030	30	4M	8.86 -	7	126	
0031	31	2M	8.89 -	7	77	
0032	32	1M	8.80 -	7	126	
0033	33	3L	9.20	8	136	

* = standard mean nursery flour protein = 8.4 mill used = Quad

SWW	9.29	8	161
SWW	9.05	7	135
SWW	0.174	0.7	42.5
SWW	9.29	8	161
SRW	8.88	7	272
SWW	9.29	8	161
HWW	8.41	6	52
HWW			

COMMENTS: Quality parameters of SRW, SRW and HWW lines in this nursery were graded by comparison to the standard mean of Stephens. Breeder #2 had a red seed coat color and was classified as SRW. Breeder #29 had a NIR wheat hardness value of 57 and was classified as HWW. Cookies were baked on all lines. Rapid Visco Analyzer (RVA) viscosity was determined on all lines. RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable.

Alkaline flour color (COLOR) was scored only on those lines which had a NIR wheat hardness value of near 40 and above and a minimum RVA viscosity of 150. *Color represents an extremely important quality criterion in Asian types of noodles. A preliminary alkaline flour color test was initiated. An alkaline Pekar slick was used to subjectively measure flour color. The Pekar slick was prepared by pressing flour to a smooth surface, immersing in a 1.0% alkaline solution consisting of 60% K₂CO₃ and 40% Na₂CO₃ for 2 minutes. The sample rested at a room temperature of (77°F) for 4 hours before visual observation and scoring. Flours were scored by the following; S = satisfactory, Q = questionable, and U = unsatisfactory. Desirable flour color ranges from bright white through creamy yellow to bright yellow. Any dullness, brown, or greenish casts would be unacceptable. Alkaline flour color (COLOR) is scored only on SRW, HWW, SWS and HWS wheats which have a minimum RVA viscosity of 150 and a minimum NIR wheat hardness (UWHRD) value of 40.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
*0001	MCKAY	1	HRS	62.2	82	12.7	69.8	10.9	0.35	83.0	11.4	62.4
0002	OR 485010	2	HRS	62.5	78	13.8	68.6	-	0.39	79.7	11.7	63.0
0003	OR4870456	3	HRS	62.2	66	12.0	69.3	10.9	0.40	-2	11.1	63.1
*0004	Klastic	4	HWS	62.5	62	14.1	66.1	10.2	0.36	73.2	12.6	64.6
0005	OR 484013	5	HWS	62.8	80	12.7	70.6 +2	9.1	0.39	-	11.4	63.6
0006	OR4870279	6	HWS	62.0	69	13.5	69.3 +2	11.2	0.37	80.0 +2	11.9	63.6

* = standard mean nursery flour protein = 11.7 mill used = Buhler

Standard Mean	HRS	62.2	82	12.7	69.8	10.9	0.35	83.0	11.4	62.4
Nursery Mean	HRS	62.3	75	12.8	69.2	10.9	0.38	80.2	11.4	62.8
Nursery Standard deviation	HRS	0.17	8.3	0.91	0.60	0.00	0.026	2.54	0.30	0.38
Standard Mean	HWS	62.5	62	14.1	66.1	10.2	0.36	73.2	12.6	64.6
Nursery Mean	HWS	62.4	70	13.4	68.7	10.2	0.37	78.0	12.0	63.9
Nursery Standard deviation	HWS	0.40	9.1	0.70	2.32	1.04	0.015	4.18	0.60	0.58

SAMPLE#	BREEDER#	MTYPE	BABS	MTIME	LVOL	BCRGR	PROQ	RVA	COLOR*
*0001	1	4H	64.6	5.1	1010	3	+1	100	
0002	2	4H	66.2	4.3	965 -	4	+1	189	
0003	3	3H	65.3	3.6 -	975	4	+1	184	
*0004	4	6H	68.8	5.8	1110	4	+1	244	S
0005	5	4H	67.8	3.8 -	915 -2	5	+1	187	S
0006	6	4H	66.8	4.5 -	1065 -	4	+1	256	S

* = standard mean nursery flour protein = 11.7 mill used = Buhler

HRS	64.6	5.1	1010	3	100
HRS	65.4	4.3	983	4	158
HRS	0.80	0.75	23.6	0.6	50.0
HWS	68.8	5.8	1110	4	244
HWS	67.8	4.7	1030	4	229
HWS	1.00	1.01	102.1	0.6	36.9

COMMENTS: Quality parameters of HRS lines were graded by comparison to the standard mean of McKay. Quality parameters of HWS lines were graded by comparison to the standard mean of Klasic. Rapid Visco Analyzer (RVA) viscosity was determined on all lines. RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable.

Alkaline flour color (COLOR) was scored only on the three HWS lines. *Color represents an extremely important quality criterion in Asian types of noodles. A preliminary alkaline flour color test was initiated. An alkaline Pekar slick was used to subjectively measure flour color. The Pekar slick was prepared by pressing flour to a smooth surface, immersing in a 1.0% alkaline solution consisting of 60% K₂CO₃ and 40% Na₂CO₃ for 2 minutes. The sample rested at a room temperature of (77°F) for 4 hours before visual observation and scoring. Flours were scored by the following; S = satisfactory, Q = questionable, and U = unsatisfactory. Desirable flour color ranges from bright white through creamy yellow to bright yellow. Any dullness, brown, or greenish casts would be unacceptable. Alkaline flour color (COLOR) is scored only on SWW, HWW, SWS and HWS wheats which have a minimum RVA viscosity of 150 and a minimum NIR wheat hardness (UWHRD) value of 40.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0001	ORCR 8601	1	HRW	62.2	67	12.5	59.2 -2	22.7	0.29 +	79.1	10.7	59.7
0002	OR 8301134	2	HRW	63.0	56	12.8	61.6	25.9	0.28 +	82.1	10.8	62.7
0003	OR 840157	3	HRW	61.9	54	12.6	59.4 -	23.8	0.32	77.7 -	10.5	59.8
0004	OR8400214H	4	HRW	60.6	50	13.3	59.3 -2	28.5	0.32	77.6 -	11.5	61.8
0005	OR 899001	5	SRW	56.6 -2	49	13.0	60.5	26.2	0.33	77.1 -	10.6	58.5
0006	OR 889165	6	HRW	59.5 -	57	13.9	59.8 -	24.2	0.37 -2	75.5 -2	11.6	61.8
0007	OR 850513	7	SWW	60.8	43	11.9	61.8	30.9	0.31	80.1	10.0	56.3 -
0008	OR 890079	8	SWW	59.8 -	43	12.7	57.4 -2	25.9	0.34 -	72.5 -2	10.2	56.5 -
*0009	KARL	9	HRW	60.6	41	13.6	60.4	27.8	0.32	78.8	11.5	61.4
0010	92WWQCB 74	10	SWW	61.7	48	11.4	59.8 -	24.3	0.33	76.2 -	9.8	57.5 -
0011	92WWQCB 75	11	SRW	59.1 -	40	12.3	60.1 -	27.4	0.31	77.9 -	10.6	58.4 -
0012	92WWQCB 76	12	SRW	58.9 -	18	11.7	59.2 -2	34.0	0.36 -2	73.6 -2	10.1	57.1 -
0013	92WWQCB 79	13	SRW	63.2	39	11.4	64.0 +2	30.4	0.33	81.6	9.9	55.4 -2
0014	92WWQCB 81	14	HRW	62.0	62	12.6	61.2	26.3	0.35 -	78.0 -	11.2	61.2
0015	92WWQCB 82	15	SRW	61.9	40	13.4	60.7	26.6	0.33	77.4 -	11.7	59.5
0016	92WWQCB 83	16	HRW	61.6	52	13.5	58.0 -2	27.8	0.30	77.3 -	11.5	61.9
0017	92WWQCB 84	17	SWW	61.7	30	13.2	59.8 -	34.5	0.30	78.2 -	11.2	59.5
0018	92WWQCB 85	18	SWW	61.7	28	12.3	59.9 -	35.3	0.31	77.6 -	10.6	57.5 -
0019	92WWQCB 86	19	HRW	61.7	50	13.2	59.0 -2	25.4	0.35 -	75.7 -2	11.3	62.7
0020	92WWQCB 89	20	HRW	59.2 -	52	13.0	62.7 +	30.2	0.28 +	83.2 +	11.3	62.4
0021	92WWQCB 90	21	SRW	61.0	36	12.6	63.3 +	29.5	0.31	82.0	10.9	58.8
0022	92WWQCB 93	22	SRW	61.3	46	12.1	65.7 +2	33.5	0.31	85.0 +2	10.8	58.5
0023	92WWQCB 95	23	SWW	63.4	49	11.8	65.6 +2	29.2	0.32	84.3 +	10.5	58.0 -
0024	92WWQCB 98	24	HRW	61.4	52	12.5	60.6	29.1	0.33	78.4	10.9	60.5
0025	92WWQCB 109	25	HRW	60.8	52	14.2	62.7 +	27.5	0.29 +	82.7 +	11.9	61.5
*0026	KARL	26	HRW	62.4	62	12.6	62.0	28.6	0.32	80.4	11.6	62.7
*0027	ABILENE	27	HRW	63.4	47	12.1	62.3	28.8	0.30	81.8	10.2	59.3
0028	92WWQCB 116	28	SRW	62.2	45	12.3	59.9 -	27.4	0.30	78.3	10.4	60.3
0029	92WWQCB 117	29	SWW	57.8 -2	45	12.2	62.2	30.9	0.32	79.9	10.1	61.5
0030	92WWQCB 123	30	HRW	62.5	52	12.7	61.4	27.6	0.31	80.3	11.0	61.0
0031	92WWQCB 124	31	HRW	60.5	50	14.6 +	62.7 +	28.6	0.33	80.6	11.4	57.2 -
0032	OR8500374H	32	HRW	60.0 -	56	13.3	57.6 -2	27.1	0.29 +	77.4 -	12.1	59.9
0033	OR8500378H	33	SWW	59.5 -	48	13.3	62.4	29.2	0.34 -	78.9	11.3	56.3 -
0034	OR8500305P	34	SWW	59.4 -	21	11.9	58.2 -2	34.7	0.32	74.8 -2	10.0	55.5 -2

* = standard mean nursery flour protein = 10.9 mill used = Quad

Standard Mean	HRW	62.1	50	12.8	61.6	28.4	0.31	80.3	11.1	61.1
Nursery Mean	HRW	61.9	54	12.9	60.5	26.9	0.31	79.2	11.1	61.2
Nursery Standard deviation	HRW	0.87	6.9	0.58	1.46	1.98	0.022	2.10	0.49	1.16
Standard Mean	HRW	62.1	50	12.8	61.6	28.4	0.31	80.3	11.1	61.1
Nursery Mean	SRW	60.5	39	12.4	61.7	29.4	0.32	79.1	10.6	58.3
Nursery Standard deviation	SRW	2.16	9.5	0.65	2.34	3.05	0.019	3.56	0.55	1.49
Standard Mean	HRW	62.1	50	12.8	61.6	28.4	0.31	80.3	11.1	61.1
Nursery Mean	HRW	59.8	54	13.7	60.7	27.5	0.32	79.2	11.6	60.3
Nursery Standard deviation	HRW	0.57	3.3	0.71	2.48	2.55	0.041	3.41	0.36	2.34
Standard Mean	HRW	62.1	50	12.8	61.6	28.4	0.31	80.3	11.1	61.1
Nursery Mean	SWW	60.6	39	12.3	60.8	30.5	0.32	78.1	10.4	57.6
Nursery Standard deviation	SWW	1.68	10.3	0.65	2.49	3.87	0.014	3.40	0.54	1.87

SAMPLE#	BREEDER#	MTYPE	CODI	TGS	BABS	MTIME	LVOL	BCRGR	PROQ	RVA	COLOR*
0001	1	5H			63.9	3.7 -	880 -	6	+1		
0002	2	5H			65.9	4.2	900 -	4	+1		
0003	3	6M			63.0	3.9	910	5	+1		
0004	4	4H			64.0	4.4	930	3	+1		
0005	5	3M			60.7 -	2.0 -2	840 -2	5	0		
0006	6	3H			64.0	2.6 -	870 -	5	0	206	U
0007	7	3M	8.41	6						181	S
0008	8	4L	8.26	5						103	
*0009	9	6H			64.6	6.7	985	4	+1		
0010	10	7M			59.7 -	5.0	775 -2	7	0	73	
0011	11	5H			62.6	4.5	755 -2	6	-1		
0012	12	3M			58.3 -2	2.6 -	840 -2	6	+1		
0013	13	4M			57.1 -2	3.5 -	890 -	4	+1		
0014	14	4H			64.4	3.4 -	880 -	4	0		
0015	15	3H			63.7	2.5 -2	860 -2	6	-1		
0016	16	6M			64.1	3.9	845 -2	4	-1	223	
0017	17	4M	8.54	6						221	
0018	18	3M	9.14	7							
0019	19	5H			64.9	4.3	855 -2	4	0		
0020	20	3H			64.6	3.1 -	875 -	6	0	140	
0021	21	2H			61.0 -	2.5 -2	860 -2	6	0		
0022	22	3H			60.7 -	3.4 -	850 -2	5	0		
0023	23	3H			60.2 -	2.6 -	925	5	+1	235	Q
0024	24	7M			62.7	4.7	895 -	4	+1		
0025	25	2H			63.7	2.2 -2	880 -	6	-1		
*0026	26	5H			64.9	5.4	950	3	+1		
*0027	27	4M			61.5	3.3	905	4	+1		
0028	28	4H			65.0	3.7 -	885 -	4	+1		
0029	29	5H			61.7	5.2	860 -2	5	+1	181	U
0030	30	5H			62.2	5.3	865 -2	4	0		
0031	31	3M	8.43	5						158	Q
0032	32	4H			62.1	4.0	925	4	0	86	
0033	33	3M	8.50	7						160	S
0034	34	2M	8.51	6						149	

* = standard		mean nursery flour protein = 10.9	mill used = Quad
HRW		63.7	5.1
HRW		63.8	4.3
HRW		1.21	1.12
SRW		63.7	5.1
SRW		61.1	3.1
SRW		2.63	0.82
HRW		63.7	5.1
HRW		63.6	3.2
HRW		1.31	0.71
HRW		63.7	5.1
HRW		60.5	4.3
HRW		1.04	1.45

COMMENTS: Quality parameters of HRW, HWW, SWW and SRW selections in this nursery were graded by comparison to the standard mean of Karl and Abilene. NIR wheat hardness value varied considerably among selections in this nursery. Breeder #9 (Karl) and Breeder #27 (Abilene) had NIR wheat hardness value less than 50, however, both were classified as HRW since they are commercial varieties. All other lines were classified as Hard (red or white) if NIR wheat hardness value was 50 or higher and as soft (red or white) if NIR wheat hardness value was less than 50. Cookies were baked on those SWW lines which had typical soft wheat properties (as judged by softness and weak mixogram properties) and on HWW lines which had unacceptable bread type mixogram properties (i.e. short dough mixing time and weak dough mixing properties). Since no appropriate SWW check variety was included in this nursery, cookie diameter and top grain score could not be graded. Breeder #18 had good cookie diameter. Bread was baked on all other lines, several of which had questionable mixogram properties for bread type wheats, (i.e. mixing time too short and questionable dough mixing properties). Bread crumb grain score of some lines was comparable to the standard mean, others were judged to be near 850 cc, as graded by their Protein Quality (PROQ) rating. The mean nursery flour protein content was 10.9%. At this level one should expect loaf volume to be near 850 cc, if the protein is of good quality. Bread crumb grain score of some lines was comparable to the standard mean, others were judged to be less in bread crumb grain score. Rapid visco analyzer (RVA) viscosity was determined on all HWW and SWW lines. RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable.

Alkaline flour color (COLOR) was scored on those HWW and SWW lines which had NIR wheat hardness value of 40 and above and a RVA value of 150 or higher. *Color represents an extremely important quality criterion in Asian types of noodles. A preliminary alkaline flour color test was initiated. An alkaline Pekar slick was used to subjectively measure flour color. The Pekar slick was prepared by pressing flour to a smooth surface, immersing in a 1.0% alkaline solution consisting of 60% K₂CO₃ and 40% Na₂CO₃ for 2 minutes. The sample rested at a room temperature of (77°F) for 4 hours before visual observation and scoring. Flours were scored by the following; S = satisfactory, Q = questionable, and U = unsatisfactory. Desirable flour color ranges from bright white through creamy yellow to bright yellow. Any dullness, brown, or greenish casts would be unacceptable. Alkaline flour color (COLOR) is scored only on SWW, HWW, SWS and HWS wheats which have a minimum RVA viscosity of 150 and a minimum NIR wheat hardness (UWHRD) value of 40.

YEAR 92 NURSERY 065 QUANTUM 542				Q	REARDAN, WA				J. PROCTOR				PAGE 1	
SAMPLE#	VARIETY			BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
*0001	QUANTUM 542				HRW	58.2	63	13.8	62.1	28.3	0.35	79.0	12.3	64.2
* = standard mean nursery flour protein = 12.3 mill used = Quad														
SAMPLE#	BREEDER#	MTYPE	BABS	MTIME	LVOL	BCRGR	PROQ							
*0001		4H	66.4	3.6	1010	3	+1							
* = standard mean nursery flour protein = 12.3 mill used = Quad														

COMMENTS: Quantum 542 was grown at the Gary Wegner Ranch, Reardon, WA and submitted by him. It was from Jim Proctor, Perfection Seed Inc., Walla Walla, WA. Since no HRW check variety was received with this selection, quality parameters cannot be graded by comparison. Test weight (TWT) would be considered questionable. Wheat hardness (UWHRD) is satisfactory. Wheat and flour protein content would be considered very good for pan-type bread. Milling quality, as judged by flour yield (FYELD) and milling score (MSCOR), would be considered quite poor. Water absorption estimated by a mixogram (MABS) and baking absorption (BABS) would be considered satisfactory. This line exhibited a good mixogram type (MTYPE) and satisfactory dough mixing time (MTIME). It had very good loaf volume. Loaf volume significantly exceeded that expected for its flour protein content as graded by its Protein Quality (PROQ) rating. Bread crumb grain score (BCRGR) was judged to be nearly satisfactory.

Without an appropriate check variety, it is difficult to judge whether quality parameters of this line are typical. It should be grown with a HRW check variety such as Hatton and submitted again for quality testing.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0001	PG801063	01	HRS	56.6 -2	63	10.5 -	65.7	28.5	0.42 -2	79.1 -2	8.8 -	57.8 -
0002	PG801069	02	HRS	62.2 +	85	11.1	67.8 +	28.9	0.34	85.4	9.3	58.7 -
0003	PG801076	03	HRS	56.6 -2	67	11.0	65.7	29.1	0.40 -2	80.1 -2	9.4	58.8
0004	PG801081	04	HRS	63.1 +	94	11.5	67.1	29.0	0.31 +	86.3	10.0	61.8
0005	PG801088	05	HRS	63.4 +	77	12.2	68.4 +	28.7	0.31 +	87.6 +	10.2	62.2
0006	PG801099	07	HRS	63.1 +	83	12.1	68.3 +	28.2	0.31 +	87.5 +	10.2	61.1
0007	PG801102	08	HRS	62.2 +	80	10.9	68.7 +	29.4	0.33	86.9 +	9.7	61.2
0008	PG802026	09	HRS	58.6 -	78	12.6	66.5	27.4	0.34	84.1	10.8	63.0
0009	906R	11	HRS	60.0	66	12.4	66.4	28.3	0.33	84.5	10.4	61.6
0010	PG802044	14	HRS	57.3 -	70	11.0	66.4	29.5	0.33	84.5	9.3	60.1
0011	PG802049	16	HRS	57.6 -	83	11.2	66.5	29.7	0.33	84.6	9.8	61.0
0012	PG802050	17	HRS	61.7	73	10.8	68.9 +2	29.1	0.32	87.6 +	8.9 -	59.7
0013	PG802053	18	HRS	58.2 -	87	10.5 -	69.7 +2	32.3	0.32	88.5 +	8.9 -	60.3
0014	PG804019	22	HRS	57.8 -	65	10.4	66.1	30.4	0.33	84.2	10.1	61.8
0015	PG804026	25	HRS	56.7 -2	53	10.8	66.1	32.2	0.32	84.7	9.5	59.0
0016	PG804033	28	HWS	60.0	85	12.0	66.6	25.3	0.35	83.7	10.3	62.0
0017	PG804041	29	HRS	57.8 -	93	13.1	64.0 -2	25.6	0.34	81.5	11.3	63.0
*0018	906R	31	HRS	60.4	71	11.8	66.2	27.5	0.35	83.2	9.8	60.7
0019	PG804053	30	HRS	59.0	69	10.7	63.5 -2	22.8	0.33	81.5 -	8.8 -	58.6
0020	PG804054	34	HRS	59.6	10	11.9	65.0 -	26.5	0.34	82.5 -	10.1	60.8
0021	PG804062	36	HRS	57.1 -	78	12.9	62.9 -2	26.2	0.33	80.8 -	10.5	59.6
0022	PG804069	37	HRS	58.5 -	85	10.4 -	63.5 -2	26.4	0.36 -	79.9 -2	8.6 -	57.1
0023	PG804072	40	HRS	59.1	74	10.3 -	65.7	27.5	0.35	82.7	8.9 -	57.0
0024	PG804088	47	HRS	59.0	61	11.0	65.7	26.7	0.34	83.2	9.1	58.1
0025	PG804091	48	HRS	59.5	76	11.8	66.9	31.7	0.30 +	86.6	9.8	59.4
*0026	906R	51	HRS	60.4	77	11.8	67.7	28.7	0.33	85.9	10.3	61.2
0027	PG805029	55	HRS	58.8	71	12.1	63.7 -2	22.7	0.37 -	78.6 -2	10.2	62.5
0028	PG805032	57	HWS	58.1 -	66	10.4 -	66.0	30.2	0.36 -	82.5 -	8.5 -	57.2
0029	PG805047	63	HRS	56.9 -	72	11.1	68.1 +	30.9	0.33	86.3	9.9	59.3
0030	PG805049	65	HRS	60.1	80	11.3	63.4 -2	24.4	0.37 -	79.3 -2	9.1	59.7
0031	PG805052	68	HRS	60.9	81	11.6	62.5 -2	23.6	0.36 -	78.9 -2	9.6	60.5
0032	PG805056	69	HRS	60.0	71	11.3	68.5 +	29.8	0.36 -	85.1	9.9	59.7
*0033	906R	71	HRS	60.4	37	12.5	66.3	27.2	0.32	84.9	10.8	62.4
0034	PG810001	76	SWS		40	8.9 -2						
0035	PG810004	77	SWS									
0036	PG810005	78	SWS		37	9.8 -						
0037	PG810008	80	SWS		48	9.8 -						
0038	PG810020	85	HWS		76	9.5 -						
0039	PG804086	87	HRS	61.2	85	11.2	69.1 +2	31.6	0.29 +2	89.4 +2	9.9	61.9
0040	PG805044	88	HRS	58.1 -	85	12.7	63.3 -2	24.2	0.39 -2	78.1 -2	10.9	62.4
				58.4 -	70	13.6	60.5 -2	25.0	0.38 -2	75.7 -2	11.3	60.4

* = standard
mean nursery flour protein = 9.8 mill used = Quad

	HRS	60.3	71	12.1	66.7	27.9	0.33	84.6	10.3	61.5
Standard Mean	Nursery	Mean	73	11.6	65.9	27.7	0.34	83.3	9.8	60.3
	HRS	1.95	14.7	0.86	2.16	2.52	0.028	3.25	0.74	1.66
	HWS									
	HRS	60.3	71	12.1	66.7	27.9	0.33	84.6	10.3	61.5
Standard Mean	Nursery	Mean	75	11.2	67.5	29.5	0.33	85.5	9.6	60.1
	HWS	1.92	8.0	0.66	1.41	2.86	0.031	3.06	0.79	2.30

SAMPLE#	BREEDER#	MTYPE	BABS	MTIME	LVOL	BCRGR	PROQ	RVA	COLOR
0001	01	6M	64.0	4.2	795 -2	6	+1		
0002	02	4M	61.9 -	3.3	835 -2	5	+1		
0003	03	4M	63.0 -	3.5	905 -	5	+1		
0004	04	4H	64.0	3.7	880 -2	5	+1		
0005	05	4H	64.4	4.1	1025 +	5	+1		
0006	07	4H	63.3	3.8	935 -	5	+1		
0007	08	4H	63.4	3.2	945	3	+1		
0008	09	3H	65.2	3.3	950	4	+1		
*0009	11	4H	63.8	5.1	950	2	+1		
0010	14	6M	63.3	4.7	875 -2	5	+1		
0011	16	4M	65.2	3.6	885 -2	6	+1		
0012	17	8M	63.9	5.8 +	825 -2	5	+1		
0013	18	8M	64.5	5.8 +	845 -2	4	+1		
0014	22	3M	65.0	3.4	895 -2	6	+1		
0015	25	7M	61.2 -	7.2 +2	890 -2	5	+1		
0016	28	3H	66.2	3.6	920 -	5	+1	233	S
0017	29	2H	67.2	2.5 -	945	4	+1		
*0018	31	4H	63.9	4.0	975	2	+1		
0019	33	4M	63.8	3.5	760 -2	9	+1		
0020	34	4M	65.0	3.0	845 -2	8	+1		
0021	36	2H	64.3	3.4	905 -	5	+1		
0022	37	6M	62.3 -	3.8	775 -2	8	+1		
0023	40	4M	61.2 -	3.5	850 -2	7	+1		
0024	47	4M	64.3	3.5	825 -2	6	+1		
0025	48	4M	62.6 -	3.6	835 -2	7	+1		
*0026	51	6M	65.4	3.4	995	2	+1		
0027	55	5H	67.7	6.0 +	1015	2	+1		
0028	57	4M	64.4	3.2	860 -2	3	+1	283	Q
0029	63	5M	63.5	3.6	905 -	3	+1	275	S
0030	65	6M	65.9	2.8 -	705 -2	8	-1		
0031	68	6M	66.7	3.8	825 -2	8	+1		
0032	69	5M	63.9	3.0	960	2	+1		
*0033	71	6M	68.6	4.1	990	2	+1		
0034	76								
0035	77								
0036	78								
0037	80								
0038	85	2M	63.1 -	1.9 -	870 -2	6	+1		
0039	87	2H	67.6	2.5 -	940	6	+1		
0040	88	2H	64.6	1.9 -	840 -2	8	-1		

* = standard mean nursery flour protein = 9.8 mill used = Quad

HRS	65.4	4.2	978	2
HRS	64.4	3.9	888	5
HRS	1.78	1.13	77.4	2.1
HRS	65.4	4.2	978	2
HWS	64.3	3.1	889	6
HWS	1.38	0.81	28.4	2.1
			264	26.9

COMMENTS: Quality parameters of HRS and HWS lines were graded by comparison to the standard mean of 906R. Breeder #'s 28, 57, 63 and 85 had white seed coat color and were classified as HWS. Breeder #'s 76, 77, 78 and 80 had white seed coat color and NIR wheat hardness values less than 50. They were classified as SWS and were excluded from any further testing. Bread was baked on all HRS and HWS lines. Rapid Visco Analyzer (RVA) viscosity was determined on all HWS lines. RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable.

Alkaline flour color (COLOR) was scored on all HWS lines, except Breeder #38 which had insufficient flour for the color test. *Color represents an extremely important quality criterion in Asian types of noodles. A preliminary alkaline flour color test was initiated. An alkaline Pekar slick was used to subjectively measure flour color. The Pekar slick was prepared by pressing flour to a smooth surface, immersing in a 1.0% alkaline solution consisting of 60% K₂CO₃ and 40% Na₂CO₃ for 2 minutes. The sample rested at a room temperature of (77°F) for 4 hours before visual observation and scoring. Flours were scored by the following; S = satisfactory, Q = questionable, and U = unsatisfactory. Desirable flour color ranges from bright white through creamy yellow to bright yellow. Any dullness, brown, or greenish casts would be unacceptable. Alkaline flour color (COLOR) is scored only on SWS, HWS and HWS wheats which have a minimum RVA viscosity of 150 and a minimum NIR wheat hardness (UWHRD) value of 40.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0001	K9205001	01	HWS	59.6 -	79	13.3 -	65.3 +	26.7	0.35	82.3	12.1 -	63.0 -2
0002	K9205002	02	HWS	59.2 -	74	13.1 -	64.5	25.7	0.38 -	79.9	11.5 -	62.1 -
0003	K9205003	03	HWS	59.4 -	73	13.2 -	63.9	26.1	0.36 -	80.3	11.6 -	63.3 -2
0004	K9205004	04	SWS	61.5	27	12.6	63.4	41.7	0.30 +	82.7	10.0	55.8
0005	K9205005	05	SWS	61.7	33	12.8	65.4 +	37.3	0.30 +	85.3 +	10.2	56.8
0006	K9205006	06	SWS	61.4	24	12.5	66.1 +	34.8	0.30 +	86.2 +2	10.2	57.0
0007	K9205007	07	SWS	60.6	25	11.9	65.7 +	38.6	0.32 +	84.4 +	9.8	56.0
0008	K9205008	08	SWS	60.7	27	11.9	67.0 +2	34.1	0.25 +2	90.5 +2	9.7	56.8
0009	K9205009	09	SWS	60.4 -	25	12.4	64.8	33.7	0.27 +2	86.4 +2	9.7	58.0
0010	K9205010	10	SWS	61.2	24	12.0	65.8 +	34.2	0.25 +2	89.0 +2	9.4	56.0
*0011	PENAWAWA	11	SWS	62.0	28	11.4	64.2	35.3	0.33	81.8	9.3	56.9
0012	K9205011	12	SWS	61.7	32	11.8	62.5 -	33.1	0.26 +2	84.1 +	9.5	57.0
0013	K9205012	13	SWS	62.3	29	11.1	66.9 +2	35.0	0.28 +2	88.5 +2	9.3	57.0
0014	K9205013	14	SWS	60.6	34	12.2	64.1	38.2	0.27 +2	85.5 +2	10.1	57.9
0015	K9205014	15	SWS	60.9	29	11.5	66.4 +2	34.2	0.27 +2	88.5 +2	9.4	56.9
0016	K9205029	31	SWS	60.4 -	31	12.5	59.8 -2	35.4	0.30 +	78.2 -	9.9	58.1
*0017	PENAWAWA	33	SWS	62.5	25	11.5	64.2	34.8	0.35	80.6	9.6	57.9
0018	K9205031	34	HWS	61.6	53	13.1 -	68.4 +2	34.3	0.28 +2	89.2 +2	11.6 -	63.3 -2
0019	K9205033	36	SWS	59.8 -	35	10.9	68.8 +2	37.2	0.27 +2	91.5 +2	9.1	57.1
0020	K9205034	37	SWS	61.4	28	11.5	66.4 +2	33.9	0.29 +2	87.2 +2	9.2	54.4 +
0021	K9205036	39	SWS	61.0	29	11.2	66.4 +2	34.1	0.29 +2	87.2 +2	9.1	53.8 +
0022	K9205038	41	SWS	60.2 -	36	11.5	66.1 +	34.8	0.33	84.3 +	9.5	54.7 +
0023	K9205039	42	SWS	61.0	39	12.0	65.6 +	35.0	0.27 +2	87.5 +2	9.5	53.8 +
0024	K9205044	48	SWS	61.5	32	11.7	65.2	36.5	0.27 +2	86.9 +2	9.1	55.0
0025	K9205045	49	SWS	61.6	25	12.2	65.5 +	35.3	0.28 +2	86.7 +2	10.0	55.8
0026	K9205046	50	SWS	60.3 -	21	11.0	67.8 +2	38.2	0.33	86.4 +2	9.2	54.8
0027	K9205047	51	SWS	60.1 -	28	13.7 -	62.7 -	32.8	0.35	78.7 -	11.4 -	58.0
0028	K9205048	52	SWS	60.2 -	25	13.0 -	60.8 -2	33.0	0.35	76.2 -2	10.5	56.1
0029	K9205049	53	SWS	62.2	24	11.0	67.5 +2	36.2	0.33	86.1 +2	9.1	56.0
0030	K9205051	56	SWS	59.0 -	38	11.2	67.1 +2	37.1	0.30 +	87.5 +2	9.1	55.8
0031	K9205052	57	SWS	60.6	28	11.4	63.7	39.4	0.27 +2	85.0 +	9.3	56.4
0032	K9205053	58	SWS	61.1	36	11.5	64.6	39.0	0.30 +	84.3 +	9.2	56.3
0033	K9205054	59	SWS	58.7 -2	36	11.7	65.1	34.3	0.32 +	83.6 +	9.4	56.0
0034	K9205055	60	SWS	61.8	29	11.9	66.3 +	35.5	0.28 +2	87.7 +2	9.7	57.1
0035	K9205056	61	SWS	63.2	33	12.1	65.3 +	36.6	0.28 +2	86.4 +2	9.6	57.0
0036	K9205057	62	SWS	59.9 -	27	11.9	65.4 +	36.5	0.32 +	84.0 +	9.5	57.0
0037	K9205058	63	SWS	59.8 -	28	11.9	64.0	38.7	0.32 +	82.2	9.7	56.9
0038	K9205059	64	SWS	58.6 -2	25	12.1	66.9 +2	41.8	0.32 +	85.9 +2	9.7	57.0
0039	K9205060	65	SWS	60.1 -	22	12.5	62.3 -	37.5	0.33	79.4	9.9	57.4
0040	K9205063	69	SWS	60.4 -	30	11.7	68.5 +2	35.6	0.36 -	85.4 +	9.5	55.8

* = standard mean nursery flour protein = 9.8 mill used = Quad

SAMPLE#	BREEDER#	MTYPE	CODI	TGS	BABS	MTIME	LVOL	BCRGR	PROQ	RVA	COLOR*
0001	01	3H	8.10 -2	6	66.2	3.5	1065	1	+1	172	Q
0002	02	4H	8.02 -2	6	67.3	4.1	1105	2	+1	170	Q
0003	03	4H	7.91 -2	6	68.5	4.3	960	3	+1	177	Q
0004	04	2M	8.86	7						173	
0005	05	1M	8.93	7						151	
0006	06	1M	8.95	8						132	
0007	07	2M	9.10	8						108	
0008	08	3L	8.96	8						194	
0009	09	2M	9.14	8						150	
0010	10	2M	8.59 -	7						156	
*0011	11	3M	9.18	7						226	
0012	12	2M	9.06	7						145	
0013	13	3M	8.99	8						147	
0014	14	2M	8.88	7						195	
0015	15	4M	8.74 -	7						117	
0016	31	3M	8.79 -	6						214	
*0017	33	4M	8.93	7						234	
0018	34	3M	8.71 -	7	62.5	3.8	930	3	+1	207	U
0019	36	1M	9.46 +	9 +						236	
0020	37	1M	8.99	8						204	
0021	39	1M	9.29	8						216	
0022	41	2M	9.18	8						201	
0023	42	1M	8.90	7						214	Q
0024	48	2M	8.71 -	7						208	
0025	49	1M	9.02	7						192	
0026	50	1M	9.41 +	9 +						132	
0027	51	1M	9.10	7						200	
0028	52	1M	9.00	7						203	
0029	53	2M	8.78 -	8						170	
0030	56	1M	8.90	6						221	Q
0031	57	2M	9.43 +	9 +						185	
0032	58	2M	9.25	8						189	
0033	59	2M	8.82	7						190	
0034	60	2M	8.90	7						131	
0035	61	2M	9.14	8						277	
0036	62	2M	9.00	7						118	
0037	63	2M	9.41 +	8						179	
0038	64	2M	9.04	8						178	
0039	65	2M	8.89	7						171	
0040	69	2M	9.21	8						150	

* = standard mean nursery flour protein = 9.8 mill used = Quad

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0041	K9205124	136	SWS	62.7	28	11.2	68.5 +2	35.7	0.27 +2	91.1 +2	9.0	56.8
0042	K9205133	146	SWS	58.8 -2	31	12.0	63.9	37.5	0.31 +	82.7	9.8	56.9
0043	K9205136	149	SWS	60.9	30	11.1	67.0 +2	35.0	0.32 +	86.1 +2	9.0	56.7
0044	K9205140	153	SWS	61.7	21	12.3	66.9 +2	33.7	0.32 +	85.9 +2	10.0	56.8
0045	K9205148	162	SWS	61.7	24	11.2	65.3 +	33.7	0.34	82.6	9.1	56.7
0046	K9205158	173	SWS	60.4 -	25	11.5	62.8 -	34.1	0.32 +	80.7	9.5	56.2
0047	K9205159	174	SWS	58.9 -	19	12.0	63.8	34.5	0.32 +	82.0	9.8	56.8

* = standard mean nursery flour protein = 9.8 mill used = Quad

Standard Mean	SWS	62.2	26	11.4	64.2	35.0	0.34	81.2	9.4	57.4
Nursery Mean	HWS	60.0	70	13.2	65.5	28.2	0.34	82.9	11.7	62.9
Nursery Standard deviation	HWS	1.11	11.5	0.10	2.00	4.09	0.043	4.31	0.27	0.57
Standard Mean	SWS	62.2	26	11.4	64.2	35.0	0.34	81.2	9.4	57.4
Nursery Mean	SWS	60.8	28	11.8	65.3	35.9	0.30	85.0	9.6	56.4
Nursery Standard deviation	SWS	1.10	4.7	0.59	1.98	2.18	0.029	3.38	0.46	1.04

SAMPLE#	BREEDER#	MTYPE	COOI	TGS	BABS	MTIME	LVOL	BCRGR	PROQ	RVA	COLOR*
0041	136	2M	8.98	7						254	
0042	146	2M	8.68	6						179	
0043	149	5M	9.19	8						164	
0044	153	2M	8.98	7						240	
0045	162	1M	9.12	8						115	
0046	173	2M	9.16	8						192	
0047	174	1M	9.20	7						157	

* = standard mean nursery flour protein = 9.8 mill used = Quad

SWS	9.06	7								230	
HWS	8.19	6			66.1	3.9	1015			182	
HWS	0.359	0.5			2.59	0.35	83.4	1.0		17.3	
SWS	9.06	7								230	
SWS	9.03	7								182	
SWS	0.205	0.7								39.7	

COMMENTS: Quality parameters of SWS and HWS lines in this nursery were graded by comparison to the standard mean of Penawawa. Breeder #'s 1, 2, 3 and 34 had NIR wheat hardness value greater than 50 and were classified as HWS. All other lines were classified as SWS. Cookies were baked on all lines. Bread was baked only on those lines classified as HWS. Grading was not possible for the bread quality parameters (BABS, MTIME, LVOL and BCRGR), since no appropriate HWS check variety was included in the nursery for comparison.

Rapid Visco Analyzer (RVA) viscosity was determined on all lines. RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable.

Alkaline flour color (COLOR) was scored only on those lines with a NIR hardness value near 40 and above and having a minimum RVA viscosity of 150. *Color represents an extremely important quality criterion in Asian types of noodles. A preliminary alkaline flour color test was initiated. An alkaline Pekar slick was used to subjectively measure flour color. The Pekar slick was prepared by pressing flour to a smooth surface, immersing in a 1.0% alkaline solution consisting of 60% K₂CO₃ and 40% Na₂CO₃ for 2 minutes. The sample rested at a room temperature of (77°F) for 4 hours before visual observation and scoring. Flours were scored by the following; S = satisfactory, Q = questionable, and U = unsatisfactory. Desirable flour color ranges from bright white through creamy yellow to bright yellow. Any dullness, brown, or greenish casts would be unacceptable. Alkaline flour color (COLOR) is scored only on SWS, HWS, and HWS wheats which have a minimum RVA viscosity of 150 and a minimum NIR wheat hardness (UWHRD) value of 40.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0001	MCKAY		HRS	62.6	78	11.0	68.0	29.5	0.34	85.6	9.8	60.7
*0002	KLASIC		HWS	63.9	44	11.5	66.9	28.4	0.33	85.0	9.8	59.8
0003	ML0316		HWS	59.6 -2	51	12.7	62.6 -2	24.8	0.37 -	78.4 -2	11.5 +	67.6 +2

* = standard mean nursery flour protein = 10.4 mill used = Quad

Standard Mean

Nursery Mean

Nursery Standard deviation

Standard Mean

Nursery Mean

Nursery Standard deviation

Standard Mean

Nursery Mean

Nursery Standard deviation

Standard Mean

Nursery Mean

Nursery Standard deviation

SAMPLE#	BREEDER#	MTYPE	BABS	MTIME	LVOL	BCRGR	PROQ	RVA	COLOR*
0001		4H	62.4	6.7	870 -2	4	+1	141	
*0002		7H	64.0	7.3	1025	4	+1	205	S
0003		5H	69.8 +2	5.0 -	1025	5	+1	205	Q

* = standard mean nursery flour protein = 10.4 mill used = Quad

HWS	64.0	7.3	1025	4	205
HRS	62.4	6.7	870	4	141
HWS	64.0	7.3	1025	4	205
HWS	66.9	6.2	1025	4	205
HWS	4.10	1.63	0.0	0.7	0.0

COMMENTS: Selections in this nursery were grown in the Willamette Valley and were submitted by Russ Karow, OSU, Corvallis, OR. Quality parameters of McKay and the HWS selection ML0316 were graded by comparison to the standard mean of Klasic. The HWS selection ML0316 had test weight (TWT), flour yield (FYELD) and milling score (MSCOR) significantly poorer than that of Klasic. Wheat and flour protein content (WPROT and FPROT) were significantly higher than that of Klasic. Mixogram and baking absorption (MABS and BABS) were exceptionally higher than that of Klasic and McKay, partially due to its higher flour protein content. Bake mixing time (MTIME) of ML0316 would be considered rather long (5.0 min), however it was considerably shorter than Klasic. ML0316 had excellent loaf volume (LVOL). It's loaf volume significantly exceeded that expected for its flour protein content as graded by its Protein Quality Rating (PROQ). Bread crumb grain (BCRGR), however was judged to be slightly under that of Klasic. Rapid Visco Analyzer (RVA) viscosity was run on Klasic and ML0316. RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable.

ML0316 had alkaline flour color (COLOR) judged as questionable. *Color represents an extremely important quality criterion in Asian types of noodles. A preliminary alkaline flour color test was initiated. An alkaline Pekar slick was used to subjectively measure flour color. The Pekar slick was prepared by pressing flour to a smooth surface, immersing in a 1.0% alkaline solution consisting of 60% K₂CO₃ and 40% Na₂CO₃ for 2 minutes. The sample rested at a room temperature of (77°F) for 4 hours before visual observation and scoring. Flours were scored by the following; S = satisfactory, Q = questionable, and U = unsatisfactory. Desirable flour color ranges from bright white through creamy yellow to bright yellow. Any dullness, brown, or greenish casts would be unacceptable. Alkaline flour color (COLOR) is scored only on SWW, HWW, SWS and HWS wheats which have a minimum RVA viscosity of 150 and a minimum NIR wheat hardness (UWHRD) value of 40.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0001	PENAWAWA		SWS	61.8	24	11.4	66.3	37.0	0.44 -2	77.5 -2	9.1	56.7
*0002	OWENS		SWS	62.4	23	11.5	65.8	41.0	0.35	82.6	9.0	54.9
0003	ML064P		SWS	63.5	17	12.8	68.4 +2	41.5	0.34	86.6 +	10.7 -	59.0 -
0004	ML04P		SWS	63.3	22	11.3	68.7 +2	42.5	0.37 -	85.0 +	9.7	57.9 -

* = standard mean nursery flour protein = 9.6 mill used = Quad

Standard Mean	SWS	62.4	23	11.5	65.8	41.0	0.35	82.6	9.0	54.9
Nursery Mean	SWS	62.8	22	11.8	67.3	40.5	0.38	82.9	9.6	57.1
Nursery Standard deviation	SWS	0.79	3.1	0.70	1.46	2.42	0.045	3.97	0.78	1.76

SAMPLE#	BREEDER#	MTYPE	COOI	TGS	CAVOL	SCSCOR	RVA
0001		2M	9.14 -	7	1330	77	174
*0002		2M	9.45	8	1360	77	217
0003		3M	8.70 -2	6 -	1375	77	169
0004		3M	9.19 -	8	1300 -	74	189

* = standard mean nursery flour protein = 9.6 mill used = Quad

SWS	9.45	8	1360	77	217
SWS	9.12	7	1341	76	187
SWS	0.311	1.0	33.3	1.5	21.6

COMMENTS: This nursery was grown in the Willamette Valley and came from Russ Karow, OSU, Corvallis, OR. Quality parameters of SWS selections in this nursery were graded by comparison to the standard mean of the check variety Owens. All selections had test weight (TWT) and NIR wheat hardness (UWHRD) comparable to Owens. Selection ML064P had significantly higher wheat and flour protein content. Flour yield (FYELD) and milling score (MSCOR) of ML064P and ML04P were significantly higher than that of the standard mean. Flour water absorption as measured by the mixograph (MABS) was also significantly higher for these two selections, partially because of higher flour protein content. Selection ML064P had poor cookie diameter (COOI) and cookie top grain score (TGS) compared to Owens. Selection ML04P had questionable cookie diameter and also a significantly smaller Japanese sponge cake volume (CAVOL) compared to Owens.

Rapid Visco Analyzer (RVA) viscosity was determined on all lines. RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable.

Alkaline flour color (COLOR) was not scored on any of these selections since their NIR wheat hardness values were less than 40.

SAMPLE#	VARIETY	BREEDER#	CLASS	%BRAN	%MIDD	%BFYELD	%PFYELD
0001	NUGAINES	1	SWW	26.3	47.1	26.6	73.7
0002	STEPHENS	2	SWW	26.1	47.8	26.0	73.9
0003	MALCOLM	3	SWW	25.6	46.9	27.5	74.4
0004	HILL-81	4	SWW	25.8	46.5	27.7	74.2
0005	MADSEN	5	SWW	23.4	47.6	28.9	76.6
0006	DAWS	6	SWW	27.0	43.1	29.9	73.0
0007	LEWJAIN	7	SWW	23.9	49.7	26.4	76.1
0008	KHOR	8	SWW	24.0	50.3	25.7	76.0
0009	ELTAN	9	SWW	29.9	42.9	27.2	70.1
0010	ROO	10	SWW	23.5	45.7	30.8	76.5
0011	SYRINGA	11	SWW	29.8	44.4	25.9	70.2
0012	MORO	12	CLUB	22.8	55.1	22.0	77.2
0013	ELGIN	13	CLUB	24.7	49.9	25.4	75.3
0014	CREW	14	CLUB	26.2	48.2	25.6	73.8
0015	TRES	15	CLUB	29.3	42.8	27.9	70.7
0016	HYAK	16	CLUB	24.7	50.6	24.6	75.3
0017	RELY	17	CLUB	29.6	44.4	26.0	70.4
0018	WA007621	18	SWW	23.7	48.3	28.0	76.3
0019	OR000855	19	SWW	24.2	46.8	29.0	75.8
0020	WA007729	20	SWW	21.5	52.8	25.6	78.5
0021	WA007689	21	SWW	23.7	40.2	36.1	76.3
0022	WA007686	22	SWW	23.0	48.0	28.9	77.0
0023	WA007687	23	SWW	23.3	49.4	27.3	76.7
0024	WA007663	24	SWW	23.0	49.8	27.2	77.0
0025	WA007664	25	SWW	23.6	52.1	24.3	76.4
0026	WA007730	26	SWW	25.5	47.6	27.0	74.5
0027	WA691213	27	SWW	24.1	47.2	28.7	75.9
0028	VB089024	28	SWW	22.8	51.0	26.2	77.2
0029	VC089042	29	SWW	24.8	52.3	22.9	75.2
0030	VD088175	30	SWW	27.3	51.5	21.3	72.7
0031	VH086048	31	SWW	22.2	51.1	26.7	77.8
0032	VH087384	32	SWW	29.0	43.7	27.3	71.0
0033	VH087512	33	SWW	26.6	47.6	25.8	73.4
0034	VH088448	34	SWW	26.6	47.9	25.6	73.4
0035	VH089541	35	SWW	27.1	40.3	32.6	72.9
0036	VH089544	36	SWW	23.8	49.5	26.7	76.2
0037	VH089608	37	SWW	24.6	48.5	26.8	75.4
0038	VH089689	38	SWW	23.7	43.7	32.6	76.3
0039	VM085568	39	SWW	27.3	47.5	25.2	72.7
0040	VH089358	40	SWW	29.2	48.1	22.7	70.8

mill used = Quad

SAMPLE#	VARIETY	BREEDER#	CLASS	%BRAN	%MDDS	%BFYELD	%PFYELD
0041	VH089218	41	HHW	21.4	42.7	35.9	78.6
0042	VH090012	42	SHW	22.1	51.6	26.3	77.9
0043	VD090181	43	SHW	23.2	52.6	24.2	76.8
0044	VG090219	44	SHW	22.6	52.6	24.8	77.4
0045	VH090032	45	HHW	22.5	44.0	33.5	77.5
0046	VH090036	46	SHW	24.4	48.8	26.8	75.6
0047	VH090344	47	HHW	23.7	42.3	34.1	76.3
0048	VH090397	48	SHW	24.6	48.5	26.8	75.4
0049	VH090437	49	SHW	22.6	51.8	25.6	77.4
0050	VH090514	50	SHW	24.3	47.9	27.8	75.7
0051	VH090551	51	SHW	24.9	48.3	26.8	75.1
0052	VH090604	52	HHW	23.0	41.3	35.7	77.0
0053	VH090656	53	SHW	24.3	46.4	29.2	75.7
0054	VJ090105	54	SHW	22.6	53.4	24.0	77.4
0055	VJ090677	55	SHW	25.7	51.1	23.1	74.3
0056	VJ090683	56	SHW	31.7	41.1	27.2	68.3
0057	VM090687	57	SHW	25.1	49.4	25.5	74.9
0058	WA007717	58	SHW	24.8	46.4	28.8	75.2
0059	ORFW0301	59	SHW	24.4	50.6	25.0	75.6
0060	OR832784	60	SHW	29.0	42.3	28.8	71.0
0061	ORFW3115	61	SHW	26.0	48.2	25.9	74.0
0062	ORF73336	62	SHW	21.5	49.9	28.6	78.5
0063	OR833765	63	SHW	24.0	47.0	29.0	76.0
0064	OR840815	64	SHW	20.4	53.1	26.5	79.6
0065	ID081277	65	SHW	25.6	45.8	28.5	74.4
0066	ORCW8635	66	HHW	21.9	43.1	34.9	78.1
0067	OR830801	67	SHW	24.5	45.6	29.8	75.5
0068	WA007697	68	SHW				
0069	WA007622	69	SHW	20.5	54.0	25.5	79.5
0070	WA007690	70	SHW	20.5	49.5	30.0	79.5
0071	VB091005	71	SHW	24.3	47.6	28.2	75.7
0072	VB091012	72	HHW	19.2	42.9	37.9	80.8
0073	VB091023	73	SHW	23.2	50.9	25.9	76.8
0074	VB091025	74	SHW	19.9	51.2	28.9	80.1
0075	VJ091139	75	SHW	21.9	50.3	27.8	78.1
0076	VJ091143	76	SHW	21.1	50.4	28.5	78.9
0077	VH091753	77	HHW	19.9	43.7	36.3	80.1
0078	VJ091149	78	SHW	23.5	47.9	28.7	76.5
0079	VH091208	79	SHW	22.7	49.9	27.4	77.3
0080	VH091210	80	SHW	25.3	45.6	29.1	74.7

mill used = Quad

SAMPLE#	VARIETY	BREEDER#	CLASS	%BRAN	%MIDD	%BFYELD	%PFYELD
0081	VH091211	81	SWW	26.4	46.2	27.4	73.6
0082	VH091216	82	SWW	25.0	48.1	26.9	75.0
0083	VH091232	83	HW	20.9	47.2	31.9	79.1
0084	VH091279	84	SWW	27.0	42.2	30.8	73.0
0085	VH091283	85	SWW	26.0	46.1	27.9	74.0
0086	VH091289	86	SWW	23.6	50.3	26.0	76.4
0087	VH091290	87	SWW	26.5	45.8	27.7	73.5
0088	VH091299	88	SWW	24.4	46.7	28.9	75.6
0089	VH091308	89	SWW	24.7	49.5	25.8	75.3
0090	VH091355	90	SWW	28.2	43.6	28.2	71.8
0091	VH091362	91	SWW	22.9	43.3	33.8	77.1
0092	VH091366	92	SWW	25.2	48.2	26.6	74.8
0093	VH091369	93	SWW	23.8	44.7	31.5	76.2
0094	VH091390	94	SWW	26.1	46.5	27.4	73.9
0095	VH091411	95	SWW	23.6	48.1	28.3	76.4
0096	VH091426	96	SWW	22.5	52.2	25.3	77.5
0097	VH091467	97	SWW	23.5	48.2	28.3	76.5
0098	VH091498	98	SWW	24.8	46.1	29.1	75.2
0099	VH091505	99	HW	20.4	47.9	31.7	79.6
0100	VH091528	100	SWW	21.3	50.5	28.1	78.7
0101	VH091548	101	HW	21.5	44.3	34.2	78.5
0102	VH091552	102	HW	21.2	48.3	30.5	78.8
0103	VH091553	103	HW	21.5	43.7	34.9	78.5
0104	VH091566	104	SWW	25.9	47.9	26.2	74.1
0105	VH091570	105	SWW	29.0	41.7	29.4	71.0
0106	VH091602	106	SWW	30.2	43.9	26.0	69.8
0107	VH091650	107	SWW	21.5	51.2	27.3	78.5
0108	VH091651	108	HW	21.8	44.8	33.4	78.2
0109	VH091666	109	SWW	24.2	50.7	25.1	75.8
0110	VH091682	110	SWW	23.0	52.0	25.0	77.0
0111	VH091685	111	HW				
0112	VH091692	112	SWW	23.1	49.6	27.3	76.9
0113	VH091698	113	SWW	25.6	44.8	29.6	74.4
0114	VH091699	114	SWW	30.4	41.5	28.1	69.6
0115	VH091705	115	SWW	25.5	44.1	30.4	74.5
0116	VH091709	116	HW	22.8	46.6	30.5	77.2
0117	VH091731	117	SWW	23.5	47.8	28.7	76.5
0118	VH091739	118	SWW	23.3	49.0	27.6	76.7
0119	VH091748	119	SWW	25.4	46.1	28.5	74.6
0120	WA007695	120	SWW				

mill used = Quad

YEAR 92	NURSERY 073	STATE SWW	SO	RITZVILLE, WA	C. J. PETERSON					
SAMPLE#	VARIETY	BREEDER#	CLASS	%BRAN	%MIDD	%BFYELD	%PFYELD			
0121	CASHUP	121	SWW	27.1	44.4	28.4	72.9			
0122	BASIN	122	SWW	25.6	47.7	26.7	74.4			
0123	OVESON	123	SWW	24.8	41.8	33.4	75.2			
0124	DURHEIM'S-PRIDE	124	SWW	24.6	46.3	29.2	75.4			
0125	WA007732	125	SWW	25.1	47.9	26.9	74.9			
0126	SALMON	130	SWW							
0127	PB183058	131	SWW							
0128	PB185001	132	SWW							

mill used = Quad

COMMENTS: Selections in this nursery were milled on the Short Flow Quadrumat milling system. Wheat samples (approximately 100g each) were conditioned (tempered) by placing the wheat (in envelopes) into a 35°F cold room for sufficient time to bring the wheat moisture content to 13.0%. The conditioned wheat was then ground only through the Quadrumat break rolls. Sifting of the break stock was as described: The bran was removed after 1 minute sifting time. The middling stock was removed after an additional 2 minutes (3 minutes total) sifting time. This is the standard sifting schedule used in our Modified Quadrumat SR. Milling Procedure. No test weight was recorded for selections in this nursery. Reported data is percent bran (% BRAN), percent break flour yield (% BFYELD), percent unground middling stock (% MIDD), and percent potential flour yield (% PFYELD). See brief description of reported data below:

% Bran: The percentage by weight of the total products recovered as bran.

% Break Flour: The percentage by weight of the total products recovered as flour off the break rolls.

% Unground Middling Stock: The percentage by weight of the total products recovered as unground middling stock.

% Potential Flour Yield: The percentage by weight of the total products recovered as break flour and unground middling stock.

SAMPLE#	VARIETY	BREEDER#	CLASS	LOCATION	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT
0001	UC 657		CLUB	PULLMAN	55.5	24	11.3	68.0	23.3	0.33	75.8	8.9
0002	UC 657		CLUB	LIND	55.2	39	14.5	66.2	18.2	0.43	68.0	11.6
0003	UC 657		CLUB	ROYAL SL	56.8	17	10.7	69.3	25.9	0.39	77.1	9.1
0004	UC 657		CLUB	MAYVIEW	55.1	22	11.7	69.1	22.5	0.34	79.4	9.5
0005	UC 657		CLUB	REARDAN	62.2	38	11.7	70.8	19.0	0.35	79.5	9.7
0006	UC 657		CLUB	FAIRFIELD	58.7	37	12.3	69.1	21.4	0.37	75.5	10.2
0007	PENAWAWA		SWS	PULLMAN	53.5	20	12.5	64.2	20.3	0.37	68.2	10.5
0008	PENAWAWA		SWS	LIND	55.1	30	13.8	63.8	17.3	0.44	65.8	11.5
0009	PENAWAWA		SWS	ROYAL SL	58.3	23	11.2	67.6	23.7	0.39	74.4	9.3
0010	PENAWAWA		SWS	MAYVIEW	54.5	20	11.6	68.6	21.9	0.33	79.7	9.7
0011	PENAWAWA		SWS	REARDAN	61.7	25	11.1	66.7	18.7	0.34	74.5	9.1
0012	PENAWAWA		SWS	FAIRFIELD	59.3	28	12.2	67.7	19.9	0.39	73.4	10.0

* = standard mean nursery flour protein = 9.9 mill used = Buhler

SAMPLE#	BREEDER#	MABS	MTYPE	CODI	TGS	CAVOL	SCSCOR
0001		50.7	3M	9.01	7	1425	83
0002		53.7	1H	8.50	6	1260	70
0003		51.5	2M	8.91	7	1350	77
0004		52.3	2M	9.04	7	1435	87
0005		52.2	2M	8.75	7	1315	76
0006		53.3	2M	9.12	8	1345	77
0007		55.9	6M	8.62	6	1335	74
0008		60.0	3H	8.22	6	1225	66
0009		54.1	3M	9.15	8	1355	80
0010		54.8	4M	8.82	7	1365	81
0011		54.8	3M	8.62	7	1330	77
0012		56.6	4M	8.70	7	1285	74

* = standard mean nursery flour protein = 9.9 mill used = Buhler

COMMENTS: Quality parameters of Spring Club selection (UC657) and the soft white spring variety, Penawawa from six Washington locations were evaluated. UC657 is a candidate for possible release. Overall, UC657 (for most locations) had some advantage in major quality parameters, i.e., flour yield, milling score, cookie diameter, sponge cake volume and score.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0001	SAMPLE 21		SWW	53.9	31	12.2	66.5	15.0	0.34	73.4	9.8	54.1
0002	SAMPLE 28		SWW	55.4	37	11.8	65.9	16.6	0.35	72.3	9.7	54.6

* = standard mean nursery flour protein = 9.8 mill used = Buhler

SAMPLE#	BREEDER#	MTYPE	CODI	TGS	CAVOL	SCSCOR	RVA
0001		2M	8.75	7	1255	71	130
0002		3M	8.44	6	1215	68	104

* = standard mean nursery flour protein = 9.8 mill used = Buhler

COMMENTS: The two SWW selections in this nursery were grown at the Southern Oregon Experiment Station. No check variety was included in the nursery for quality parameter comparison and grading. Without the data of a check variety, it is difficult to tell whether these lines have typical SWW quality characteristics. Test weight of both lines was low; this undoubtedly contributed to low flour yield and milling score. Cookie diameter and sponge cake volume of both lines would be considered questionable to poor.

Rapid Visco Analyzer (RVA) viscosity was determined on both lines. RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS	MTYPE	CODI	TGS
0001	15B	1	CLUB		32										
0002	15C	2	CLUB	59.0	26	10.4	68.8 +	41.2	0.37 -	85.2	8.9	52.1	2M	9.49	9
0003	16B CREW	3	CLUB		34										
0004	16C CREW	4	CLUB	60.1	30	11.5	66.3 -	39.3	0.35	83.2	9.5	53.3 -	1M	8.98 -	8
0005	17B TYEE	5	CLUB		36										
*0006	17C TYEE	6	CLUB	59.0	31	11.2	67.2	39.5	0.35	84.4	9.4	51.3	2M	9.14	8
0007	18B TRES	7	CLUB		29										
*0008	18C TRES	8	CLUB	61.5	45	11.7	67.9	37.3	0.34	85.9	9.4	49.4	1M	9.44	8
0009	19B HYAK	9	CLUB		38										
0010	19C HYAK	10	CLUB	61.3	42	11.0	67.7	36.7	0.31 +	87.6 +	8.8	53.4 -	3L	8.69 -2	7
0011	20C	12	CLUB	61.2	34	11.0	68.0	38.8	0.34	86.1	8.8	51.5	1M	9.00 -	7
0012	21B	13	CLUB		28										
0013	21C	14	CLUB	62.5 +	37	12.0	68.0	36.0	0.30 +2	88.6 +	9.7	51.4	1M	9.18	8
0014	22B	15	CLUB		31										
0015	22C	16	CLUB	63.5 +	30	11.0	65.7 -	36.3	0.34	83.1	9.1	50.3	2M	9.32	8
0016	23B	17	CLUB		30										
0017	23C	18	CLUB	64.1 +2	27	11.3	67.7	37.1	0.34	85.7	9.3	49.6	1H	9.24	8
0018	25B	19	CLUB		39										
0019	25C	20	CLUB	62.0 +	35	11.0	66.3 -	36.1	0.36	82.6 -	9.1	49.6	2M	8.81 -	7
0020	26B	21	CLUB		35										
0021	26C	22	CLUB	62.7 +	42	10.5	68.7 +	34.5	0.35	86.3	8.9	50.1	2M	8.91 -	7
0022	27B	23	CLUB		43										
0023	28B	24	CLUB		35										
0024	28C	25	CLUB	62.7 +	34	10.7	68.7 +	34.9	0.35	86.3	9.1	49.3	2M	8.83 -	7
0025	30B	26	CLUB		39										
0026	30C	27	CLUB	62.7 +	32	10.6	68.1	35.9	0.36	84.9	8.8	49.9	2M	9.06	8

* = standard mean nursery flour protein = 9.1 mill used = Quad

Standard Mean	CLUB	60.2	38	11.4	67.5	38.4	0.34	85.2	9.4	50.3	9.29	8
Nursery Mean	CLUB	61.7	34	11.1	67.6	37.2	0.34	85.4	9.1	50.9	9.08	8
Nursery Std. Deviation	CLUB	1.59	5.1	0.48	0.99	1.96	0.019	1.75	0.30	1.43	0.246	0.6

COMMENTS: Quality parameters of CLUB selections in this nursery were graded by comparison to the standard mean of Tyee and Tres. The selections and varieties were submitted in pairs identified as "g" and "c". Those identified with "g" were Bayleton sprayed for rust. Those identified with "c" were non-treated. Only the non-treated lines were processed for quality. Cookies were baked on these lines.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UMHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS	MTYPE	CODI	TGS
0001	15B	28	CLUB		13										
0002	15C	29	CLUB	52.5 -2	10	12.2 -	65.1 -	45.6	0.35 -2	81.7 -2	10.0 -	51.8 -	2M	9.51	8
0003	16B CREW	30	CLUB		24										
0004	16C CREW	31	CLUB	58.9	37	11.6 -	65.6	37.1	0.46 -2	75.3 -2	9.6 -	51.1	2M	8.98 -	5 -2
0005	17B TYEE	32	CLUB		33										
*0006	17C TYEE	33	CLUB	58.3	26	10.6	66.4	37.9	0.30	86.6	8.4	52.4	3M	9.09	7
0007	18B TRES	34	CLUB		16										
*0008	18C TRES	35	CLUB	57.0	24	9.1	66.5	42.6	0.31	86.1	7.4	45.3	2L	9.79	9
0009	19B HYAK	36	CLUB		24										
0010	19C HYAK	37	CLUB	56.9	20	10.3	67.3	42.2	0.29	88.3	7.8	48.1	2L	9.26	8
0011	20B	38	CLUB		20										
0012	20C	39	CLUB	56.8	16	9.4	66.0	40.0	0.27 +	88.0	8.2	51.1	4L	9.35	8
0013	21B	40	CLUB		26										
0014	21C	41	CLUB	57.0	20	10.2	66.4	42.0	0.27 +	88.5 +	8.3	50.1	1L	9.32	8
0015	22B	42	CLUB		19										
0016	22C	43	CLUB	59.6 +	17	10.3	63.2 -2	39.6	0.29	83.1 -	8.6	51.3	1L	9.18 -	8
0017	23B	44	CLUB		18										
0018	23C	45	CLUB	58.7	12	9.5	67.3	42.6	0.29	88.3	7.9	48.4	1L	9.35	8
0019	24B	46	CLUB		21										
0020	24C	47	CLUB	56.6	28	10.1	65.7	40.6	0.31	85.0	8.2	49.0	3M	9.32	8
0021	25B	48	CLUB		17										
0022	25C	49	CLUB	57.7	19	10.8	64.4 -	38.4	0.29	84.6	8.9	47.9	2M	8.95 -	8
0023	26B	50	CLUB		23										
0024	26C	51	CLUB	57.5	21	10.8	66.8	39.2	0.28 +	88.3	8.7	48.8	3M	9.30	8
0025	27B	52	CLUB		24										
0026	27C	53	CLUB	59.3	25	11.8 -	64.8 -	34.4	0.32	83.2 -	9.6 -	50.9	1M	9.14 -	8
0027	28B	54	CLUB		16										
0028	28C	55	CLUB	58.1	19	10.6	66.4	39.2	0.30	86.6	9.0	48.9	2M	9.68	9
0029	29B	56	CLUB		39										
0030	29C	57	CLUB	56.8	38	11.2	64.7 -	34.5	0.33 -	82.5 -	9.2	49.0	1M	8.76 -2	7
0031	30B	58	CLUB		20										
0032	30C	59	CLUB	58.0	22	11.1	64.8 -	39.2	0.36 -2	80.7 -2	8.8	48.0	2M	9.40	8

* = standard mean nursery flour protein = 8.7 mill used = Quad

Standard Mean	CLUB	57.7	25	9.9	66.4	40.2	0.31	86.3	7.9	48.9	9.44	8
Nursery Mean	CLUB	57.5	22	10.6	65.7	39.7	0.31	84.8	8.7	49.5	9.27	8
Nursery Standard deviation	CLUB	1.63	7.0	0.86	1.14	2.96	0.047	3.62	0.71	1.85	0.263	0.9

COMMENTS: Quality parameters of CLUB selections in this nursery were graded by comparison to the standard mean of Tyee and Tres. The selections and varieties were submitted in pairs identified as "B" and "C". Those identified with "B" were Bayleton sprayed for rust. Those identified with "C" were non-treated. Only the non-treated lines were processed for quality. Cookies were baked on these lines. The high flour ash content of Sample #920004 16C (Crew) was verified and this may partially explain its smaller cookie diameter.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS	MTYPE	CODI	TGS
0001	5	60	CLUB	57.0 +	23	11.9	66.4	40.7	0.29 +	87.2	9.8	52.0 -	1M	9.31	8
0002	6	61	CLUB	58.1 +	14	12.2	66.3	42.5	0.29 +	87.1	9.8	51.6 -	2M	9.57	8
0003	8	62	CLUB	57.7 +	15	12.0	63.1 -2	41.3	0.33 -	80.4 -2	9.8	51.0	1M	9.29	8
0004	11	63	CLUB	54.3	16	12.4	63.7 -	40.2	0.35 -	79.9 -2	9.9	49.9	2M	9.05 -	8
0005	13	64	CLUB	56.6	22	13.0	61.8 -2	37.8	0.32	79.4 -2	10.1	50.5	2M	9.05 -	8
0006	14	65	CLUB	56.7	30	12.5	66.0	39.2	0.34 -	83.5	10.0	49.9	2M	9.12 -	8
0007	15	66	CLUB	59.2 +2	29	13.1	64.7 -	35.3	0.35 -	81.2 -	10.8	49.9	1M	8.95 -	7 -
0008	17	67	CLUB	57.4 +	23	12.7	64.7 -	38.5	0.32	83.1	10.1	49.1	2M	9.20	7 -
0009	19	68	CLUB	57.8 +	39	12.7	63.9 -	34.5	0.31	82.7 -	10.2	49.6	1M	8.69 -2	7 -
0010	20	69	CLUB	56.3	24	12.3	64.5 -	40.2	0.34 -	81.6 -	9.9	48.9	1M	9.50	8
*0011	21 TYEE	70	CLUB	54.0	22	11.6	65.5	40.9	0.30	85.4	9.1	49.0	2M	9.66	9
*0012	22 TRES	71	CLUB	56.5	19	12.2	66.1	40.6	0.32	84.9	9.9	48.0	1M	9.14	8
0013	23 HYAK	72	CLUB	56.5	21	11.7	65.3	38.6	0.28 +	86.4	9.5	51.5 -	4M	9.09 -	7 -
0014	24 RELY??	73	CLUB	58.2 +	11	11.5	61.5 -2	39.3	0.30	80.3 -2	9.1	51.5 -	3M	8.98 -	7 -

* = standard mean nursery flour protein = 9.9 mill used = Quad

Standard Mean	CLUB	55.2	20	11.9	65.8	40.8	0.31	85.2	9.5	48.5	9.40	8
Nursery Mean	CLUB	56.9	22	12.3	64.5	39.3	0.32	83.1	9.9	50.2	9.19	8
Nursery Standard deviation	CLUB	1.42	7.5	0.50	1.58	2.23	0.023	2.74	0.43	1.21	0.262	0.6

COMMENTS: Quality parameters of CLUB selections in this nursery were graded by comparison to the standard mean of Tyee and Tres. Cookies were baked on all lines. Sample #920014 was questionable being identified as the variety Rely when these samples were submitted for quality testing.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0001	CACHE	1	HRW	61.5	75	15.2	59.5 -2	25.3	0.33	77.3 -2	13.4	65.5
*0002	HANSEL	2	HRW	61.4	80	14.7	64.8	28.4	0.34	82.3	13.4	67.2
0003	MANNING	3	HRW	62.0	81	13.6	62.4 -2	26.6	0.34	79.8 -	12.3	65.5
*0004	PROMONTORY	4	HRW	62.7	76	13.1	65.2	27.0	0.35	82.2	12.2	64.0
0005	1602-134	5	HRW	62.7	77	13.3	65.2	30.2	0.34	82.7	12.6	64.5
0006	1650-150	6	HRW	60.2 -	92	13.6	62.0 -2	26.5	0.33	79.9 -	12.3	64.7
0007	1784-334	7	HRW	61.0	68	13.7	61.4 -2	25.4	0.34	78.8 -	12.2	64.9
0008	1802,1812-190	8	SRW	62.5	24	13.4	59.5 -2	32.8	0.28 +2	79.0 -	11.1 -	60.7 -
0009	1820-46	9	HRW	61.3	75	13.7	65.4	27.2	0.32 +	84.0	12.0	63.8
0010	1820-64	10	HRW	61.7	77	12.3 -	65.9	29.1	0.34	83.5	11.5	62.7 -
0011	1874-16	11	HRW	62.5	81	13.2	65.1	27.1	0.34	82.6	11.7	61.5 -
0012	1874-39	12	HRW	61.5	65	14.1	63.3 -	26.8	0.33	81.3	12.3	61.2 -
0013	1874-120	13	HRW	61.9	68	13.5	62.4 -2	25.9	0.33	80.3	12.2	62.7 -
0014	1891-103	14	HRW	60.6	81	13.4	62.3 -2	25.9	0.34	79.7 -	12.2	63.8
0015	1942-142	15	HRW	61.5	79	13.0	64.3	26.6	0.33	82.3	11.9	64.3
0016	1942-149	16	HRW	60.9	63	12.6	65.1	28.1	0.30 +2	84.7 +	11.5	62.4 -
0017	1942-321	17	HRW	60.3 -	72	12.7	64.8	28.0	0.34	82.3	11.6	63.0
0018	1944-103	18	HRW	61.8	66	13.9	67.2 +	29.5	0.29 +2	87.4 +2	12.8	65.2
0019	1944-149	19	HWW	62.7	65	13.9	65.8	28.0	0.31 +	84.9 +	12.6	65.7
0020	1944-151	20	HRW	61.8	77	13.4	65.6	28.0	0.29 +2	85.8 +	12.4	64.8
0021	1944-157	21	HWW	62.5	85	14.1	65.8	27.4	0.32 +	84.4 +	13.0	65.7
0022	1944-158	22	HWW	61.2	67	13.5	66.5 +	28.7	0.33	84.6 +	12.3	66.7
0023	1944-186	23	HRW	62.1	68	13.3	64.8	26.3	0.30 +2	84.4 +	11.9	63.8
0024	1944-208	24	HRW	61.7	77	13.4	66.0	27.5	0.30 +2	85.6 +	11.8	63.8
0025	1956-121	25	HRW	61.0	70	13.6	61.9 -2	26.5	0.34	79.3 -	12.1	62.0 -
0026	1969-30	26	HRW	61.1	69	13.3	63.4 -	27.5	0.29 +2	83.5	11.8	62.8 -
0027	1970-30	27	SRW	60.6	22	13.8	60.7 -2	32.0	0.34	76.8 -2	11.7	59.1 -2
0028	1956-80	28	HRW	60.7	68	13.5	64.3	26.6	0.35	81.3	11.8	63.0
0029	1956-180	29	HRW	61.2	81	12.0 -	61.9 -2	26.7	0.35	78.8 -	11.1 -	60.2 -
0030	1969-49	30	HRW	60.3 -	54	13.0	65.5	27.5	0.34	83.0	11.6	60.7 -
0031	1974-41	31	HRW	61.8	84	14.0	61.6 -2	26.7	0.32 +	80.0 -	12.8	65.9
0032	1974-215	32	HRW	61.8	69	14.4	63.8 -	26.8	0.31 +	82.8	12.7	64.8
0033	1974-234	33	HRW	61.6	65	14.4	63.8 -	27.8	0.34	81.3	12.3	64.5
0034	1974-246	34	HRW	61.9	70	14.6	61.4 -2	25.3	0.33	79.3 -	12.7	65.2
0035	1979-43	35	HRW	61.2	76	12.8	65.4	27.4	0.30 +2	85.0 +	12.0	62.8 -
0036	1979-51	36	HRW	61.7	85	13.6	62.9 -	28.5	0.30 +2	82.4	12.6	64.3
0037	1979-54	37	HRW	60.9	72	13.0	63.7 -	26.5	0.33	81.7	12.0	64.7
0038	1979-64	38	HRW	61.0	64	13.5	62.8 -2	26.1	0.31 +	81.8	12.0	62.8 -
0039	1979-79	39	HRW	60.6	60	13.0	64.9	26.8	0.33	82.9	11.8	64.3
0040	1979-133	40	HRW	59.9 -	77	14.0	61.8 -2	25.2	0.34	79.2 -	12.7	63.9

* = standard mean nursery flour protein = 12.3 mill used = Quad

SAMPLE#	BREEDER#	MTYPE	BABS	MTIME	LVOL	BCRGR	PROQ	RVA	COLOR*
0001	1	2H	67.7	1.3 -2	865 -2	7	-1		
*0002	2	4H	69.4	4.2	1100	2	+1		
0003	3	5H	68.7	4.3	1065	3	+1		
*0004	4	5H	67.2	4.3	1060	2	+1		
0005	5	2H	67.7	2.4 -	1030 -	3	+1		
0006	6	4H	66.9	3.5	1025 -	4	+1		
0007	7	2H	67.1	2.3 -	980 -2	5	+1		
0008	8	5H	62.9 -2	4.6	940 -2	3	+1		
0009	9	4H	67.0	4.2	925 -2	6	0		
0010	10	5H	64.9 -	4.4	995 -2	4	+1		
0011	11	3H	63.7 -2	3.9	860 -2	5	-1		
0012	12	2H	64.4 -	2.3 -	925 -2	6	0		
0013	13	4H	64.9 -	4.1	895 -2	4	-1		
0014	14	5H	68.0	3.7	995 -2	5	+1		
0015	15	5H	66.5	5.0	980 -2	4	+1		
0016	16	5H	64.6 -	4.7	945 -2	3	+1		
0017	17	5H	65.2 -	4.3	1025 -	3	+1		
0018	18	6H	65.9 -	6.6 +	970 -2	3	0		
0019	19	5H	67.9	5.2	995 -2	4	+1	233	S
0020	20	6H	67.0	7.5 +2	1005 -	2	+1		
0021	21	5H	67.9	5.8 +	1050	2	+1	225	S
0022	22	5H	68.9	5.3	1075	3	+1	240	S
0023	23	5H	66.0 -	5.1	995 -2	4	+1		
0024	24	4H	66.0 -	4.4	985 -2	3	+1		
0025	25	3H	64.2 -	3.4	990 -2	5	+1		
0026	26	5H	67.0	5.0	960 -2	4	+1		
0027	27	6M	61.3 -2	4.2	950 -2	4	+1		
0028	28	6H	68.2	5.8 +	1090	3	+1		
0029	29	3M	62.4 -2	2.9 -	935 -2	6	+1		
0030	30	1H	63.9 -	2.0 -	905 -2	6	0		
0031	31	5H	71.1 +	4.8	1010 -	3	+1		
0032	32	4H	68.0	4.2	1020 -	4	+1		
0033	33	5H	68.2	4.5	1020 -	2	+1		
0034	34	5H	70.4	3.6	1045	2	+1		
0035	35	3H	65.0 -	3.6	1005 -	1	+1		
0036	36	4H	67.5	4.2	1015 -	4	+1		
0037	37	5H	65.9 -	6.0 +	1010 -	2	+1		
0038	38	3H	66.0 -	3.4	1030 -	2	+1		
0039	39	5H	66.5	5.9 +	935 -2	3	+1		
0040	40	3H	68.1	3.3	975 -2	2	0		

* = standard mean nursery flour protein = 12.3 mill used = Quad

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0041	1979-150	41	HRW	60.2 -	66	13.2	65.1	27.3	0.34	82.6	12.5	63.8
0042	1979-168	42	HRW	60.6	77	13.7	63.0 -	26.2	0.31 +	82.0	12.8	64.2
0043	1980-20	43	HRW	61.2	83	12.5	63.4 -	26.8	0.34	80.8	11.6	64.4
0044	1980-47	44	HRW	61.2	75	12.2 -	63.5 -	27.1	0.36	79.9 -	11.6	62.9
0045	1980-173	45	HRW	61.1	74	12.9	63.7 -	27.1	0.34	81.2	11.9	64.3
0046	1990-8	46	SRW	61.4	35	13.9	57.0 -2	28.9	0.28 +2	75.9 -2	11.9	62.7 -
0047	1990-66	47	HRW	61.9	69	14.0	64.1	28.7	0.33	82.1	12.7	63.8
0048	1990-113	48	HRW	63.1	72	13.6	66.0	29.4	0.33	84.1	12.8	66.8
0049	1990-116	49	SRW	62.0	26	13.6	59.3 -2	31.6	0.32 +	76.2 -2	12.1	63.9
0050	1990-163	50	HRW	62.7	75	13.4	63.4 -	28.3	0.32 +	81.9	12.6	65.2
0051	1993-18	51	HRW	62.1	75	15.4	63.0 -	26.9	0.34	80.4	13.7	68.8 +
0052	1993-65	52	HRW	61.6	73	14.8	62.4 -2	25.6	0.33	80.3	13.4	69.7 +
0053	1993-70	53	SWW	63.4	21	13.4	62.4 -2	33.5	0.33	79.6 -	11.4 -	59.5 -2
0054	1993-80	54	HRW	62.0	75	13.8	64.9	29.3	0.42 -2	78.2 -	12.8	66.0
0055	1993-88	55	HRW	61.9	66	14.9	61.6 -2	25.8	0.35	78.4 -	13.6	69.9 +
0056	1993-100	56	HRW	61.1	88	14.2	61.7 -2	27.0	0.35	78.5 -	13.6	68.9 +
0057	1993-102	57	HRW	61.7	68	13.1	62.2 -2	27.1	0.33	80.1 -	12.0	65.4
0058	1994-2	58	SRW	60.8	32	13.2	61.9 -2	33.1	0.33	78.9 -	11.6	63.8
0059	1995-105	59	HRW	60.6	66	13.5	64.0	26.9	0.32 +	82.5	12.3	58.8 -2
0060	1995-159	60	HRW	61.1	69	13.0	65.6	27.1	0.38 -	81.1	11.8	64.9
0061	1996-49	61	HRW	60.8	67	12.4	64.1	26.9	0.30 +2	83.7	11.3 -	61.8 -
0062	1996-109	62	HWW	61.7	71	12.8	63.8 -	26.5	0.35	80.7	11.8	62.8 -
0063	1996-129	63	HRW	62.4	65	14.2	64.3	28.5	0.34	81.8	13.1	66.4

* = standard mean nursery flour protein = 12.3 mill used = Quad

Standard Mean	HRW	62.0	78	13.9	65.0	27.7	0.34	82.2	12.8	65.6
Nursery Mean	HRW	61.4	73	13.5	63.7	27.2	0.33	81.7	12.3	64.3
Nursery Standard deviation	HRW	0.71	7.3	0.74	1.57	1.14	0.023	2.14	0.62	2.18
Standard Mean	HRW	62.0	78	13.9	65.0	27.7	0.34	82.2	12.8	65.6
Nursery Mean	SRW	61.5	28	13.6	59.7	31.7	0.31	77.4	11.7	62.0
Nursery Standard deviation	SRW	0.80	5.5	0.29	1.83	1.67	0.028	1.49	0.38	2.09
Standard Mean	HRW	62.0	78	13.9	65.0	27.7	0.34	82.2	12.8	65.6
Nursery Mean	HWW	62.0	72	13.6	65.5	27.6	0.33	83.7	12.4	65.2
Nursery Standard deviation	HWW	0.70	9.0	0.57	1.16	0.93	0.017	1.98	0.51	1.68
Standard Mean	HRW	62.0	78	13.9	65.0	27.7	0.34	82.2	12.8	65.6
Nursery Mean	SWW	63.4	21	13.4	62.4	33.5	0.33	79.6	11.4	59.5

SAMPLE#	BREEDER#	MTYPE	BABS	MTIME	LVOL	BCRGR	PROQ	RVA	COLOR*
0041	41	3H	66.0 -	3.2	980 -2	4	+1		
0042	42	3H	66.4	3.9	1010 -	3	+1		
0043	43	5H	68.6	5.7 +	890 -2	5	0		
0044	44	6H	67.1	7.2 +2	1045	2	+1		
0045	45	5H	66.5	4.8	1000 -	4	+1		
0046	46	2H	63.4 -2	1.5 -2	915 -2	6	0		
0047	47	4H	68.0	3.6	970 -2	4	0		
0048	48	3H	69.0	2.6 -	920 -2	5	-1		
0049	49	2H	66.1	2.2 -	930 -2	4	0		
0050	50	2H	67.4	2.1 -	955 -2	4	0		
0051	51	3H	73.0 +2	3.0	1055	2	0		
0052	52	4H	73.9 +2	4.3	1015 -	2	0		
0053	53	2H	61.7 -2	2.8 -	945 -2	5	+1	255	Q
0054	54	3H	66.2	4.0	955 -2	5	0		
0055	55	5H	72.1 +	4.4	1045	2	0		
0056	56	4H	71.1 +	3.9	1025 -	4	0		
0057	57	3H	69.6	3.3	940 -2	5	0		
0058	58	2M	64.5 -	1.7 -	860 -2	6	-1		
0059	59	3H	63.0 -2	3.1	920 -2	5	0		
0060	60	5H	67.6	4.7	925 -2	6	0		
0061	61	6H	66.0 -	7.2 +2	910 -2	4	+1		
0062	62	4H	65.0 -	3.5	950 -2	3	+1	191	S
0063	63	4H	68.6	4.1	1050	2	+1		

* = standard mean nursery flour protein = 12.3 mill used = Quad

HRW	68.3	4.2	1080	2	
HRW	67.2	4.2	985	4	
HRW	2.36	1.32	55.9	1.4	
HRW	68.3	4.2	1080	2	
SRW	63.6	2.8	919	5	
SRW	1.79	1.45	35.4	1.3	
HRW	68.3	4.2	1080	2	
HW	67.4	4.9	1018	3	
HW	1.68	1.00	56.1	0.8	
HRW	68.3	4.2	1080	2	
SW	61.7	2.8	945	5	
SW					

222
21.7

255

COMMENTS: Quality parameters of HRW and HWW selections in this nursery were graded by comparison to the standard mean of Hansel and Promontory. Breeder #'s 8, 27, 46, 49 and 58 had NIR wheat hardness value less than 50 and were classified as SRW. Breeder #53 had NIR wheat hardness value less than 50 and a white seed coat. It was classified as SWW. Breeder #'s 19, 21, 22 and 62 were classified as HWW. Some lines had flour yield and/or milling score significantly less than that of the standard mean, however there were several which were comparable to the standard mean. Bread was baked on all lines. Loaf volume of many lines was significantly less than that of the standard mean, however Hansel and Promontory had loaf volume which significantly exceeded that expected for their flour protein content. Most of the selections did however have loaf volume equal to or significantly above that expected for their flour protein content as graded by their protein quality (PROQ) rating. The mean nursery flour protein content was 12.3%. At this level one should expect loaf volume to be near 940 cc, if the protein is of good quality. Bread crumb grain score of some lines was comparable to the standard mean; several were judged to be less in crumb grain score.

Rapid Visco Analyzer (RVA) viscosity was determined on the HWW lines. RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable.

Alkaline flour color (COLOR) was scored on the HWW lines. *Color represents an extremely important quality criterion in Asian types of noodles. A preliminary alkaline flour color test was initiated. An alkaline Pekar slick was used to subjectively measure flour color. The Pekar slick was prepared by pressing flour to a smooth surface, immersing in a 1.0% alkaline solution consisting of 60% K₂CO₃ and 40% Na₂CO₃ for 2 minutes. The sample rested at a room temperature of (77°F) for 4 hours before visual observation and scoring. Flours were scored by the following; S = satisfactory, Q = questionable, and U = unsatisfactory. Desirable flour color ranges from bright white through creamy yellow to bright yellow. Any dullness, brown, or greenish casts would be unacceptable. Alkaline flour color (COLOR) is scored only on SWW, HWW, SWS and HWS wheats which have a minimum RVA viscosity of 150 and a minimum NIR wheat hardness (UWHRD) value of 40.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0001	UTE	64	HRW	58.5 -2	54	12.7	62.3 -2	26.5	0.32	80.7 -	10.7	63.8
*0002	PROMONTORY	65	HRW	63.6	84	11.5	65.0	27.9	0.30	84.6	10.3	61.9
0003	1549-19	66	HRW	60.4 -	72	13.3 +	60.1 -2	25.7	0.33 -	77.9 -2	11.0	61.7
0004	1911-94	67	HRW	60.1 -2	76	13.0	64.6	27.5	0.36 -2	81.1 -	11.7	61.7
0005	1706-1	68	HRW	59.8 -2	73	12.5						
0006	1596-104	69	HRW	62.6	82	14.1 +	63.5 -	27.6	0.26 +2	85.1	12.1 +	61.9
0007	1961-233	70	HRW	60.8 -	89	13.2 +	62.8 -2	26.4	0.33 -	80.7 -	11.2	64.4
0008	1961-252	71	HRW	61.5 -	75	13.9 +	64.5	29.5	0.33 -	82.5	12.0 +	63.8

* = standard mean nursery flour protein = 11.3 mill used = Quad

Standard Mean	HRW	63.6	84	11.5	65.0	27.9	0.30	84.6	10.3	61.9
Nursery Mean	HRW	60.9	76	13.0	63.3	27.3	0.32	81.8	11.3	62.7
Nursery Standard deviation	HRW	1.62	10.5	0.82	1.71	1.25	0.031	2.49	0.68	1.20

SAMPLE#	BREEDER#	MTYPE	BABS	MTIME	LVOL	BCRGR	PROQ
0001	64	5H	67.0	4.4	915	5	+1
*0002	65	4H	67.1	3.6	900	5	+1
0003	66	4H	66.4	3.6	905	4	+1
0004	67	3H	64.9	2.9	915	5	0
0005	68						
0006	69	2H	63.1 -	2.1 -	895	5	-1
0007	70	4H	65.6	3.5	920	4	+1
0008	71	3H	66.5	3.3	925	4	0

* = standard mean nursery flour protein = 11.3 mill used = Quad

HRW	67.1	3.6	900	5
HRW	65.8	3.3	911	5
HRW	1.42	0.71	11.0	0.5

COMMENTS: Quality parameters of HRW selections in this nursery were graded by comparison to the standard mean of Promontory. A milling error occurred on Breeder #68 and no data or flour was obtained. Breeder #'s 67 and 71 had flour yield comparable to the standard mean. Breeder #'s 69 and 71 had milling score comparable to the standard mean. Bread was baked on all lines. Breeder #69 had a very short (unacceptable) mix time (MIME). All selections except Breeder #69 had loaf volume equal to or significantly above that expected for their flour protein content as graded by their Protein Quality (PROQ) rating. The mean nursery flour protein content was 11.3%. At this protein level, one should expect loaf volume to be near 875 cc, if the protein is of good quality. Bread crumb grain score of some lines was comparable to the standard mean; the others had bread crumb score judged as somewhat better.

SAMPLE#	BREEDER#	MTYPE	CODI	TGS	VISC
0001	92-1	1L	9.10	7	41
*0002	92-2	1L	9.12	8	50
0003	92-4	3L	8.89	5 -2	119 -
0004	92-8	2L	9.23	8	59
0005	92-13	3L	9.02	6 -	70
0006	92-21	1M	9.12	6 -	44
0007	92-23	1L	9.51 +	7	34
0008	92-24	1L	9.01	5 -2	41
0009	92-26	1L	9.32	7	43
0010	92-31	1M	9.43 +	8	52
0011	92-32	2M	9.11	8	61
0012	92-44	2M	9.23	7	91
0013	92-46	2M	9.10	7	100
0014	92-49	3L	8.80 -	7	86
0015	92-53	1L	9.31	8	32
0016	92-52	1L	9.26	8	56
0017	92-54	1L	9.44 +	8	44
0018	92-56	1M	9.06	7	38
0019	92-57	1M	9.62 +	8	64
0020	92-33	1M	9.24	8	45

* = standard mean nursery flour protein = 8.8 mill used = Quad

CLUB	9.12	8	50
CLUB	9.20	7	58
CLUB	0.205	1.0	23.7

COMMENTS: Quality parameters of CLUB lines in this nursery were graded by comparison to the standard mean of Paha. Cookies were baked on all lines. Brookfield viscosity (VISC) was determined on all lines.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0001	TRES MLD RES (WARDEN BLEND 1-18)	92-1	CLUB	57.7	21	8.8	69.5 -	42.7	0.35	87.3	7.0	49.6
*0002	PAHA	92-2	CLUB	58.3	17	9.8	71.3	39.9	0.36	89.0	7.8	48.6
0003	HYAK (WA7166) VPM/WA21//2*TYEE	92-4	CLUB	56.8	23	9.6	69.8 -	40.1	0.35	87.7	7.6	52.2 -
0004	WA7622 (TYEE//ROAZON/TRES-ORIGINAL)	92-8	CLUB	55.2 -	23	10.1	68.8 -2	40.0	0.33 +	87.7	8.1	50.9
0005	WA7753 (TYEE//ROAZON/TRES)	92-13	CLUB	56.2 -	26	9.6	68.2 -2	39.5	0.33 +	86.9	7.6	51.1
0006	WA6581//VPM/M951//2*BARBEE (85X660) W	92-21	CLUB	56.7	26	12.2 -	67.1 -2	39.7	0.35	84.3 -2	9.9 -	52.4 -
0007	TRES//WA7164/TRES (85X098) W CAW	92-23	CLUB	56.7	22	11.0	68.9 -2	40.0	0.38	84.6 -2	8.6	48.4
0008	TRES//WA7164/TRES (85X112) W CBW	92-24	CLUB	58.1	15	9.9	68.8 -2	38.7	0.35	86.4 -	7.9	47.8
0009	WA7752 (TRES//WA7163/TRES)	92-26	CLUB	57.8	27	10.1	71.3	41.4	0.35	89.6	8.1	47.6
0010	80X1034 WA6698//SU92/6*Q2//2629/2*O W	92-31	CLUB	56.5 -	13	10.0	66.3 -2	39.9	0.37	82.0 -2	7.9	48.6
0011	MOR//S4/2*AE/2*O//TYE/92/6*O//WST/2*O W	92-32	CLUB	56.5 -	25	10.9	67.1 -2	38.9	0.40 -	81.1 -2	8.6	51.3 -
0012	HYAK/4/6581//T142/13253/5*O//FALC/2*O W	92-44	CLUB	56.7	24	12.0 -	67.0 -2	36.5	0.40 -	81.0 -2	9.7 -	55.3 -2
0013	HYAK/4/WA6581//C13253/5*O//MS/2*O W	92-46	CLUB	56.4 -	29	12.3 -	69.2 -	39.6	0.38	85.0 -	9.8 -	55.8 -2
0014	HYAK/4/WA6581//VPM/M951//2*BR8 (W)	92-49	CLUB	55.9 -	38	12.0 -	69.1 -2	37.7	0.37	85.5 -	9.4 -	55.8 -2
0015	7217-1/4/6581//PAHA/92/6*O//3*O/TSP/ W	92-53	CLUB	56.4 -	24	11.6 -	66.1 -2	41.6	0.38	81.1 -2	9.3 -	48.9
0016	7217-1/4/6581//PAH/13645/2*CH/AE/PN/ W	92-52	CLUB	55.5 -	18	12.2 -	68.5 -2	45.1	0.36	85.4 -	9.6 -	49.3
0017	7217-1/4/M421//2*TYE//PAH/92/6*O//TYE W	92-54	CLUB	55.0 -	29	11.5 -	68.7 -2	41.4	0.39 -	83.8 -2	9.1	49.4
0018	7217/4/6581//T142/92/6*O//3*O/TSP/CTL W	92-56	CLUB	56.0 -	21	11.8 -	Milling error - flour lost					
0019	7217/4/6581//MOR//13645/2CH/AE/PN/2*O W	92-57	CLUB	54.1 -2	21	12.4 -	Milling error - flour lost					
0020	TRES//T.DIC/3*GNS//TRES (85X104) W CBW	92-33	CLUB	57.5	20	9.8	69.1 -2	36.2	0.38	84.9 -	8.4	49.3

* = standard mean nursery flour protein = 8.7 mill used = Quad

Standard Mean	CLUB	17	9.8	71.3	39.9	0.36	89.0	7.8	48.6
Nursery Mean	CLUB	23	10.9	68.6	39.9	0.36	85.2	8.7	50.8
Nursery Standard deviation	CLUB	5.5	1.15	1.47	2.10	0.022	2.66	0.88	2.70

SAMPLE#	BREEDER#	MTYPE	COOI	TGS	VTSC
0001	92-1	1L	9.32 -	8	38
*0002	92-2	1L	9.65	9	30
0003	92-4	5L	9.25 -	7 -	79
0004	92-8	3L	9.38 -	8	64
0005	92-13	4L	9.30 -	8	64
0006	92-21	1M	9.20 -	8	64
0007	92-23	1L	9.30 -	7 -	37
0008	92-24	1L	9.35 -	7 -	37
0009	92-26	1L	9.51	9	46
0010	92-31	2L	9.48	8	45
0011	92-32	2M	9.38 -	8	58
0012	92-44	2M	8.95 -2	7 -	116 -
0013	92-46	2M	9.21 -	6 -2	105 -
0014	92-49	3M	8.76 -2	6 -2	123 -
0015	92-53	1L	9.29 -	7 -	46
0016	92-52	1M	9.62	8	66
0017	92-54	1M	9.36 -	8	58
0018	92-56				
0019	92-57				
0020	92-33	1M	9.52	8	49

* = standard mean nursery flour protein = 8.7 mill used = Quad

CLUB	9.65	9	38
CLUB	9.33	8	67
CLUB	0.208	0.8	30.0

COMMENTS: Quality parameters of CLUB lines in this nursery were graded by comparison to the standard mean of Paha. Milling errors occurred on Breeder #'s 92-56 and 92-57 and the flour was lost. No valid milling, baking and mixogram, etc. data was obtained. Cookies were baked on all lines. Brookfield viscosity (VISC) was determined on all lines.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0001	TRES MLD RES (WARDEN BLEND 1-18)	92-1	CLUB	62.4	45	11.2	71.8 -2	38.7	0.39 +	87.7	9.1	53.5
*0002	PAHA	92-2	CLUB	61.9	44	10.8	74.7	38.0	0.42	89.5	9.1	54.5
0003	HYAK (WA7166) VPM/W421//2*TYEE	92-4	CLUB	61.4	49	11.4	72.7 -	37.5	0.36 +2	90.8	9.2	55.5
0004	WA7622 (TYEE//ROAZON/TRES-ORIGINAL)	92-8	CLUB	60.8	42	11.5	73.2 -	39.0	0.39 +	89.5	9.3	54.4
0005	WA7753 (TYEE//ROAZON/TRES)	92-13	CLUB	60.7	39	11.0	73.0 -	38.1	0.36 +2	91.1	9.0	52.6
0006	WA6581//VPM/M951//2*BARBEE (85X660) W	92-21	CLUB	63.1	41	12.6 -	71.3 -2	38.7	0.38 +	87.7	10.4	54.4
0007	TRES//WA7164/TRES (85X098) W CAW	92-23	CLUB	61.3	31	11.2	72.9 -	38.6	0.38 +	89.7	9.5	52.4
0008	TRES//WA7164/TRES (85X112) W CBW	92-24	CLUB	63.4	35	11.7	72.5 -	37.0	0.38 +	89.2	9.4	52.1
0009	WA7752 (TRES//WA7163/TRES)	92-26	CLUB	61.8	38	11.9	73.3 -	38.9	0.40	89.0	9.6	51.4 +
0010	80X1034 WA6698//SU92/6*02*//2629/2*0 W	92-31	CLUB	60.5	32	9.9	73.0 -	41.4	0.39 +	89.2	8.4	51.4 +
0011	MOR//S4/2*AE/2*0//TYE/92/6*0//WST/2*0 W	92-32	CLUB	60.4	31	9.9	71.5 -2	39.7	0.43	84.8 -2	8.4	50.4 +
0012	HYAK/4/6581//7142/13253/5*0//FALC/2*0 W	92-44	CLUB	61.9	36	10.9	71.7 -2	39.9	0.40	86.9 -	8.5	51.0 +
0013	HYAK/4/6581//C113253/5*0//MS/2*0 W	92-46	CLUB	61.7	44	10.8	73.3 -	41.0	0.35 +2	92.2 +	8.9	52.4
0014	HYAK/4/6581//VPM/M951//2*BRB (W)	92-49	CLUB	62.4	49	10.8	72.5 -	35.0	0.33 +2	92.4 +	8.6	53.9
0015	7217-1/4/6581//PAHA/92/6*0//3*0/TSP/ W	92-53	CLUB	62.8	34	10.3	72.2 -2	40.5	0.37 +2	89.5	8.0	52.0
0016	7217-1/4/6581//PAH/13645/2*CH/AE/PN/ W	92-52	CLUB	62.1	39	11.1	72.4 -2	41.9	0.36 +2	90.4	9.1	52.4
0017	7217-1/4/6581//2*TYE//PAH/92/6*0//TYE W	92-54	CLUB	61.0	38	9.4	71.3 -2	40.5	0.36 +2	89.0	7.9	51.6 +
0018	7217/4/6581//7142/92/6*0//3*0/TSP/CTL W	92-56	CLUB	62.5	43	11.3	71.1 -2	35.2	0.40	86.2 -	9.3	53.3
0019	7217/4/6581//MOR/13645/2CH/AE/PN/2*0 W	92-57	CLUB	61.4	44	12.6 -	71.1 -2	41.6	0.37 +2	88.1	10.2	53.4
0020	TRES//T.DIC/3*GNS//TRES (85X104) W CBW	92-33	CLUB	62.9	48	11.4	71.5 -2	33.7	0.37 +2	88.6	9.5	52.3

* = standard mean nursery flour protein = 9.1 mill used = Quad

Standard Mean	CLUB	61.9	74.7	38.0	0.42	89.5	9.1	54.5
Nursery Mean	CLUB	61.8	72.3	38.7	0.38	89.1	9.1	52.7
Nursery Standard deviation	CLUB	0.88	0.94	2.25	0.024	1.88	0.65	1.33

SAMPLE#	BREEDER#	MTYPE	CODI	TGS	VISC
0001	92-1	1L	9.05 -	7	40
*0002	92-2	1L	9.49	8	41
0003	92-4	3L	8.88 -2	7	100 -
0004	92-8	1L	9.21 -	8	59
0005	92-13	2L	8.93 -2	7	44
0006	92-21	1M	9.27	8	70
0007	92-23	1L	9.10 -	6 -	68
0008	92-24	1L	9.03 -	8	38
0009	92-26	1M	9.02 -	7	45
0010	92-31	1L	9.34	8	40
0011	92-32	2M	8.98 -	7	52
0012	92-44	2M	9.21 -	9	64
0013	92-46	2M	8.99 -	7	75
0014	92-49	3L	8.95 -2	7	81
0015	92-53	1L	9.15 -	7	34
0016	92-52	2M	9.60	9	68
0017	92-54	1L	9.45	9	45
0018	92-56	1L	8.99 -	7	45
0019	92-57	1M	9.07 -	7	117 -
0020	92-33	1L	8.95 -2	6 -	52

* = standard mean nursery flour protein = 9.1 mill used = Quad

CLUB	9.49	8	41
CLUB	9.13	7	59
CLUB	0.204	0.9	21.9

COMMENTS: Quality parameters of CLUB lines in this nursery were graded by comparison to the standard mean of Paha. Cookies were baked on all lines. Brookfield viscosity (VISC) was determined on all lines.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYIELD	BFYIELD	FASH	MSCOR	FPROT	MABS
0001	82X863 VPM/M421//2*RDR//TRES W	92-109	CLUB	61.3	43	10.2	66.9 -	37.9	0.30 +	87.2	8.0	52.5
0002	81X1095 TYEE*2/CNF15350 W	92-113	CLUB	61.2	32	10.6	66.4 -2	42.7	0.30 +	86.6	8.1	52.7
0003	TYEE//CD/TRES (W)	92-116	CLUB	58.5 -2	20	11.5	68.2	39.5	0.32	87.6	9.4	51.4
0004	VPM/M421/VH66354/WA5827/WA6241//TRES (W)	92-117	CLUB	60.8	30	11.5	66.3 -2	37.5	0.35	83.2 -2	9.4	53.3
0005	VPM/M421/VH66354/WA5827/WA6241//TRES (W)	92-118	CLUB	60.3 -	23	12.5	65.6 -2	36.8	0.34	83.0 -2	9.9	53.3
0006	84X107 VPM/M951/YMH/HYS//H81//TYEE W	92-122	CLUB	58.5 -2	50	11.8	66.0 -2	35.5	0.27 +2	88.0	9.0	52.8
0007	84X451 T.DIC/3*GNS//TRES W	92-125	CLUB	62.0	35	10.9	66.9 -	37.5	0.30 +	87.2	8.6	53.4
0008	WA7526 (82 TRES CX)/WA7526 (82 TRES CX)	92-129	CLUB	62.5	31	10.4	67.9	39.5	0.33	86.6	8.4	52.3
0009	WA7526 (82 TRES CX)/WA7526 (82 TRES CX)	92-137	CLUB	59.7 -	31	11.8	66.9 -	39.3	0.31 +	86.6	9.2	53.4
0010	HYAK CX/HYAK CX	92-140	CLUB	59.9 -	28	10.4	69.1	39.5	0.30 +	90.0	8.4	52.3
0011	HYAK CX/HYAK CX	92-148	CLUB	58.8 -	35	11.1	67.4 -	40.7	0.29 +2	88.5	8.6	53.4
0012	HYAK CX/HYAK CX	92-149	CLUB	59.3 -	30	11.4	68.0	39.1	0.31 +	88.0	9.1	51.8
0013	HYAK CX/HYAK CX	92-155	CLUB	61.3	29	10.5	68.0	40.2	0.29 +2	89.2	8.3	52.3
0014	HYAK CX/HYAK CX	92-156	CLUB	61.3	30	10.7	67.0 -	39.5	0.29 +2	88.0	8.2	53.3
0015	HYAK CX/HYAK CX	92-159	CLUB	61.0	32	10.4	68.5	38.5	0.30 +	89.2	8.4	53.4
0016	WA7437 CX/WA7437 CX	92-170	CLUB	58.8 -	31	12.2	67.5 -	37.7	0.32	86.7	9.6	52.4
0017	WA7437 CX/WA7437 CX	92-173	CLUB	59.5 -	45	12.2	67.8 -	39.0	0.29 +2	89.0	9.4	53.5
0018	HYAK	92-101	CLUB	60.8	36	11.1	68.3	37.9	0.31 +	88.3	8.6	55.1 -
0019	TRES	92-102	CLUB	62.7	47	11.1	68.5	38.6	0.32	88.0	8.7	51.1
0020	RELY	92-103	CLUB	61.7	26	10.7	68.2	39.3	0.31 +	88.2	8.3	51.1
*0021	PAHA	92-105	CLUB	62.0	28	11.1	69.0	38.8	0.33	88.0	8.8	52.0
0022	WA7671 SEL (M421/66354/5827/6241//2*H81)	92-191	SWW	61.9	20	12.2	68.6	38.5	0.34 -	86.8	10.0	55.3
0023	84X111 VPM/M951/YMH/HYS//H81//WA6910 W	92-195	SWW	61.6	40	12.2	66.3 -	35.1	0.32	85.2	9.6	55.1
0024	84X111 VPM/M951/YMH/HYS//H81//WA6910 W	92-196	SWW	57.1 -2	26	14.4 -	66.1 -	31.9	0.35 -	83.0 -	11.0	58.0
0025	84X316 SEL1/DT//820/O/1834/178383// W	92-198	SWW	58.7 -	37	12.2	66.4	39.8	0.35 -	83.4 -	10.0	58.5
0026	84X339 S1/PK//820/O/1834/1783//7163 W	92-201	SWW	59.6	27	11.8	64.0 -2	37.5	0.34 -	81.0 -2	9.3	57.4
0027	84X339 S1/PK//820/O/1834/1783//7163 W	92-202	SWW	59.8	31	12.0	65.2 -2	37.7	0.35 -	81.8 -2	9.2	55.4
0028	84X458 T.DIC/3*GNS//NGN W	92-203	SWW	62.0	28	10.8	64.7 -2	36.4	0.34 -	81.8 -2	8.6	56.9
*0029	LEWJAIN	92-204	SWW	61.2	28	12.2	67.5	35.4	0.32	86.7	9.7	56.5
0030	STEPHENS	92-205	SWW	62.3	30	11.7	66.6	38.5	0.31	86.2	9.5	56.5
0031	MADSEN	92-206	SWW	61.4	31	12.2	68.9 +	37.0	0.34 -	87.2	9.9	56.4

* = standard mean nursery flour protein = 9.1 mill used = Quad

Standard Mean

Nursery Mean

Nursery Standard deviation

Standard Mean

Nursery Mean

Nursery Standard deviation

Standard Mean

Nursery Mean

Nursery Standard deviation

SAMPLE#	BREEDER#	MTYPE	CODI	TGS	VISC	RVA
0001	92-109	3L	9.26	7	55	
0002	92-113	3L	9.25	7	65	
0003	92-116	2M	9.30	6	71	
0004	92-117	2M	9.02 -	7	78	
0005	92-118	2M	9.06	7	94	
0006	92-122	3M	9.15	8	112	
0007	92-125	1L	9.41	8	61	
0008	92-129	1L	9.48	8	50	
0009	92-137	1L	9.34	8	60	
0010	92-140	3L	9.05 -	7	66	
0011	92-148	4L	8.96 -	8	111	
0012	92-149	2M	9.05 -	8	88	
0013	92-155	4L	9.38	7	82	
0014	92-156	4L	9.10	7	89	
0015	92-159	3L	8.98 -	7	77	
0016	92-170	1M	9.21	7	78	
0017	92-173	2M	9.10	7	100	
0018	92-101	4L	9.29	7	117 -	
0019	92-102	1L	9.45	7	44	
0020	92-103	1L	9.18	6	51	
*0021	92-105	2L	9.32	7	62	126
0022	92-191	2M	9.16	6		125
0023	92-195	2M	9.25	6		127
0024	92-196	2H	8.85 -	6		139
0025	92-198	2M	8.84 -	5		156
0026	92-201	4M	8.80 -	6		160
0027	92-202	3M	8.94 -	6		157
0028	92-203	4M	9.23	6		136
*0029	92-204	2M	9.25	6		158
0030	92-205	3M	9.24	5		
0031	92-206	2M	8.90 -	6		121

* = standard mean nursery flour protein = 9.1 mill used = Quad

CLUB		9.32	7	62	
CLUB		9.21	7	78	
CLUB		0.158	0.6	20.9	
SWW		9.25	6		136
SWW		9.05	6		140
SWW		0.195	0.4		15.8

COMMENTS: Quality parameters of CLUB lines in this nursery were graded by comparison to the standard mean of Paha. Quality parameters of SW lines in this nursery were graded by comparison to the standard mean of Lewjain. Cookies were baked on all lines. Brookfield viscosity (VISC) was determined on all CLUB lines. Rapid Visco Analyzer (RVA) viscosity was run on all SW lines. RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0001	82X863 VPM/M421//2*RDR//TRES W	92-109	CLUB	56.8	28	10.7	64.5 -2	39.5	0.31	83.5 -2	9.0	53.0
0002	81X1095 TYEE*2/CNF15350 W	92-113	CLUB	57.6	34	11.1	65.6 -2	44.4	0.31	84.9 -	9.4	52.4
0003	TYEE//CD/TRES (W)	92-116	CLUB	54.1 -2	23	11.8	65.7 -2	40.4	0.31	85.0 -	10.4	53.4
0004	VPM/M421/VH66354/WA5827/WA6241//TRES (W)	92-117	CLUB	57.7	27	12.2 -	64.3 -2	37.8	0.35 -2	80.7 -2	10.6	54.1 -
0005	VPM/M421/VH66354/WA5827/WA6241//TRES (W)	92-118	CLUB	58.8	28	11.7	65.2 -2	37.9	0.35 -2	81.8 -2	10.3	53.3
0006	84X107 VPM/M951/YMH/HYS//H81//TYEE W	92-122	CLUB	56.1 -	41	11.9	64.0 -2	36.4	0.29	84.1 -2	9.8	53.1
0007	84X451 T.DIC/3*GNS//TRES W	92-125	CLUB	60.3 +	24	10.7	65.2 -2	38.3	0.32	83.8 -2	9.1	51.6
0008	WA7526 (82 TRES CX)/WA7526 (82 TRES CX)	92-129	CLUB	55.5 -	24	12.7 -	63.1 -2	39.5	0.36 -2	78.5 -2	10.9 -	53.1
0009	WA7526 (82 TRES CX)/WA7526 (82 TRES CX)	92-137	CLUB	54.6 -2	24	12.5 -	62.2 -2	39.6	0.39 -2	75.5 -2	10.5	52.9
0010	HYAK CX/HYAK CX	92-140	CLUB	53.1 -2	12	12.3 -	65.3 -2	41.0	0.36 -2	81.3 -2	10.3	52.1
0011	HYAK CX/HYAK CX	92-148	CLUB	51.2 -2	26	14.4 -2	61.3 -2	39.3	0.36 -2	76.2 -2	12.0 -	55.4 -
0012	HYAK CX/HYAK CX	92-149	CLUB	51.1 -2	22	13.4 -	61.1 -2	39.5	0.37 -2	75.3 -2	10.9 -	53.6
0013	HYAK CX/HYAK CX	92-155	CLUB	53.6 -2	27	12.9 -	62.4 -2	40.4	0.36 -2	77.6 -2	10.6	52.5
0014	HYAK CX/HYAK CX	92-156	CLUB	53.4 -2	29	12.4 -	63.2 -2	40.6	0.32	81.2 -2	10.2	53.6
0015	HYAK CX/HYAK CX	92-159	CLUB	51.1 -2	31	14.3 -2	61.3 -2	38.7	0.38 -2	75.0 -2	11.6 -	56.1 -
0016	WA7437 CX/WA7437 CX	92-170	CLUB	52.8 -2	23	12.4 -	64.2 -2	41.0	0.37 -2	79.3 -2	10.4	54.1 -
0017	WA7437 CX/WA7437 CX	92-173	CLUB	55.4 -	21	11.2	66.0 -2	42.2	0.33 -	84.1 -2	9.7	53.0
0018	HYAK	92-101	CLUB	56.9	27	11.2	65.9 -2	38.6	0.29	86.6 -	9.7	55.4 -
0019	TRES	92-102	CLUB	57.4	21	11.1	65.5 -2	40.4	0.32	84.1 -2	9.5	49.9
0020	RELY	92-103	CLUB	57.4	20	10.5	66.0 -2	40.9	0.30	86.1 -	9.0	49.6
*0021	PAHA	92-105	CLUB	58.3	22	10.6	68.4	41.4	0.30	89.1	9.3	51.0
0022	WA7671 SEL (M421/66354/5827/6241//2*H81)	92-191	SWW	57.6	16	12.9	63.9 -	40.4	0.32 +	82.1	11.2	55.1
0023	84X111 VPM/M951/YMH/HYS//H81//WA6910 W	92-195	SWW	57.3	18	12.1	62.3 -2	37.0	0.32 +	80.1 -	10.3	54.1
0024	84X111 VPM/M951/YMH/HYS//H81//WA6910 W	92-196	SWW	53.3 -2	20	13.4	62.1 -2	39.2	0.36 -	77.3 -2	11.4	57.1 -
0025	84X316 SEL1/D1//820/O/1834/178383// W	92-198	SWW	55.5 -	22	11.4	64.2 -	40.8	0.36 -	79.9 -	10.0	55.5
0026	84X339 S1/PK//820/O/1834/1783//7163 W	92-201	SWW	55.1 -	17	12.3	61.3 -2	39.1	0.38 -	75.0 -2	10.3	54.8
0027	84X339 S1/PK//820/O/1834/1783//7163 W	92-202	SWW	54.9 -	17	11.8	62.8 -2	39.1	0.37 -	77.5 -2	10.3	53.3
0028	84X458 T.DIC/3*GNS//NGN W	92-203	SWW	58.1	13	11.1	60.9 -2	38.0	0.37 -	75.1 -2	9.7	53.8
*0029	LEWJAIN	92-204	SWW	57.6	23	12.1	65.8	38.3	0.34	83.2	10.6	53.8
0030	STEPHENS	92-205	SWW	59.5 +	23	11.2	64.8	39.5	0.30 +	84.5	9.9	55.1
0031	MADSEN	92-206	SWW	56.8	37	12.4	66.4	37.6	0.36 -	82.7	11.0	53.9

* = standard mean nursery flour protein = 10.3 mill used = Quad

Standard Mean	CLUB	58.3	22	10.6	68.4	41.4	0.30	89.1	9.3	51.0
Nursery Mean	CLUB	55.4	25	12.0	64.3	39.9	0.34	81.6	10.2	53.0
Nursery Standard deviation	CLUB	2.67	5.8	1.13	1.90	1.73	0.031	4.08	0.82	1.63
Standard Mean	SWW	57.6	23	12.1	65.8	38.3	0.34	83.2	10.6	53.8
Nursery Mean	SWW	56.6	21	12.1	63.5	38.9	0.35	79.7	10.5	54.7
Nursery Standard deviation	SWW	1.84	6.6	0.73	1.87	1.20	0.027	3.40	0.57	1.12

SAMPLE#	BREEDER#	MTYPE	CODI	TGS	VISC	RVA
0001	92-109	2M	9.15	6 -	119	
0002	92-113	3M	9.36	8	102	
0003	92-116	2M	9.56 +	8	108	
0004	92-117	2M	9.29	8	112	
0005	92-118	2M	9.10	7	105	
0006	92-122	3M	8.77 -	7	135 -	
0007	92-125	1M	9.51	7	70	
0008	92-129	1M	9.19	7	77	
0009	92-137	1M	9.07	7	82	
0010	92-140	2M	9.14	7	114	
0011	92-148	4M	8.84 -	6 -	194 -2	
0012	92-149	3M	8.86 -	6 -	163 -	
0013	92-155	3M	9.02	7	148 -	
0014	92-156	3M	9.10	7	143 -	
0015	92-159	2M	9.00 -	6 -	198 -2	
0016	92-170	1M	9.05	7	108	
0017	92-173	2M	9.21	7	115	
0018	92-101	6L	9.06	8	170 -	
0019	92-102	1M	9.38	8	61	
0020	92-103	1M	9.30	7	55	
*0021	92-105	2M	9.26	8	70	172
0022	92-191	2M	9.27	7		183
0023	92-195	2M	9.09	7		170
0024	92-196	4M	9.06	6 -		172
0025	92-198	3M	9.24	7		193
0026	92-201	3M	8.79 -	8		200
0027	92-202	3M	8.86	7		199
0028	92-203	3M	8.94	7		152
*0029	92-204	2M	9.07	8		185
0030	92-205	3M	9.26	8		
0031	92-206	2M	8.90	7		14.7

* = standard

mean nursery flour protein = 10.3

mill used = Quad

CLUB						
CLUB			9.26	8	70	
CLUB			9.15	7	117	
			0.206	0.7	41.3	
SWW						
SWW			9.07	8		152
SWW			9.05	7		177
			0.173	0.6		18.2

COMMENTS: Quality parameters of CLUB lines in this nursery were graded by comparison to the standard mean of Paha. Quality parameters of SWM lines in this nursery were graded by comparison to the standard mean of Lewjain. Low test weight of several lines caused poor flour yield and milling scores and no doubt influenced several other quality parameters. Cookies were baked on all lines. Brookfield viscosity (VISC) was determined on all CLUB lines. Rapid Visco Analyzer (RVA) viscosity was run on all SWM lines. RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0001	82X863 VPM/M421//2*RDR///TRES W	92-109	CLUB	62.9	46	11.4	69.8 -	36.9	0.31 +	90.3	10.1	55.4 -2
0002	81X1095 TYEE*2/CNF15350 W	92-113	CLUB	60.1 -	34	9.7	66.7 -2	45.1	0.33	85.0 -2	8.2	51.6 -
0003	TYEE//CD/TRES (W)	92-116	CLUB	59.6 -	40	10.1	70.8	39.3	0.33	90.3	8.8	51.5 -
0004	VPM/M421/VH66354/WA5827/WA6241//TRES (W)	92-117	CLUB	62.8	46	11.2	69.1 -2	35.3	0.35	86.8 -	9.8	51.5 -
0005	VPM/M421/VH66354/WA5827/WA6241//TRES (W)	92-118	CLUB	62.7	40	11.5	69.0 -2	35.6	0.36 -	86.1 -2	10.0	51.5 -
0006	84X107 VPM/M951/YMH/HYS//H81///TYEE W	92-122	CLUB	58.0 -2	38	10.1	67.0 -2	37.5	0.32	86.1 -2	8.8	51.4 -
0007	84X451 T.DIC/3*GNS//TRES W	92-125	CLUB	62.6	42	11.1	67.7 -2	35.4	0.35	85.0 -2	9.5	51.3 -
0008	WA7526 (82 TRES CX)/WA7526 (82 TRES CX)	92-129	CLUB	61.4	32	10.9	69.0 -2	39.0	0.32	88.6 -	9.3	47.4
0009	WA7526 (82 TRES CX)/WA7526 (82 TRES CX)	92-137	CLUB	60.8	34	10.1	68.8 -2	39.0	0.34	87.1 -	8.7	48.3
0010	HYAK CX/HYAK CX	92-140	CLUB	60.6 -	43	11.3	70.5	38.3	0.33	89.9	9.7	51.0 -
0011	HYAK CX/HYAK CX	92-148	CLUB	60.6 -	48	9.9	69.1 -2	41.0	0.31 +	89.4	8.2	51.4 -
0012	HYAK CX/HYAK CX	92-149	CLUB	60.7 -	39	10.9	68.6 -2	39.3	0.31 +	88.7 -	9.2	51.3 -
0013	HYAK CX/HYAK CX	92-155	CLUB	61.5	45	9.7	70.1 -	40.2	0.32	90.0	8.4	51.3 -
0014	HYAK CX/HYAK CX	92-156	CLUB	61.6	38	10.0	68.6 -2	39.3	0.29 +2	90.0	8.6	52.3 -
0015	HYAK CX/HYAK CX	92-159	CLUB	61.0	36	10.0	69.7 -	39.4	0.32	89.5	8.6	52.3 -
0016	WA7437 CX/WA7437 CX	92-170	CLUB	60.3 -	36	9.7	69.0 -2	38.7	0.34	87.3 -	8.2	52.3 -
0017	WA7437 CX/WA7437 CX	92-173	CLUB	61.0	41	10.5	69.3 -	39.5	0.33	88.3 -	9.0	51.3 -
0018	HYAK	92-101	CLUB	61.7	40	10.1	69.4 -	36.9	0.29 +2	91.0	8.8	53.8 -2
0019	TRES	92-102	CLUB	61.7	33	10.8	69.9 -	38.3	0.33	89.1	9.2	47.5
0020	RELY	92-103	CLUB	61.0	50	9.5	69.9 -	38.9	0.33	89.1	8.4	46.8
*0021	PAHA	92-105	CLUB	62.4	46	10.2	71.3	37.2	0.33	90.9	9.1	48.0
0022	WA7671 SEL (M421/66354/5827/6241//2*H81)	92-191	SWW	62.4	41	10.2	70.8 +	36.5	0.36 -2	88.3	9.2	52.0
0023	84X111 VPM/M951/YMH/HYS//H81///WA6910 W	92-195	SWW	62.0	27	11.9	67.4 -	35.3	0.34 -	85.3 -	10.2	53.0
0024	84X111 VPM/M951/YMH/HYS//H81///WA6910 W	92-196	SWW	59.8 -	28	12.0	67.7 -	39.3	0.38 -2	83.1 -2	10.4	53.9
0025	84X316 SEL1/DT//820/O/1834/178383// W	92-198	SWW	60.1	34	12.0	66.0 -2	38.8	0.35 -	82.9 -2	10.0	54.1
0026	84X339 S1/PK//820/O/1834/1783//7163 W	92-201	SWW	60.1	35	10.8	64.4 -2	36.7	0.34 -	81.5 -2	9.0	53.3
0027	84X339 S1/PK//820/O/1834/1783//7163 W	92-202	SWW	62.1	51	10.8	66.4 -2	34.5	0.34 -	84.0 -2	9.1	53.6
0028	84X458 T.DIC/3*GNS//NGN W	92-203	SWW	61.7	41	11.1	68.9	33.1	0.32	88.5	9.5	53.1
*0029	LEWJAIN	92-204	SWW	61.6	33	11.3	67.0 -	39.4	0.32	86.1 -	9.6	53.3
0030	STEPHENS	92-205	SWW	61.6	33	11.3	67.0 -	39.4	0.32	86.1 -	9.6	53.3
0031	MADSEN	92-206	SWW	61.6	44	10.2	68.7	35.0	0.33	87.6	9.2	53.3

* = standard mean nursery flour protein = 9.2 mill used = Quad

Standard Mean	CLUB	62.4	46	10.2	71.3	37.2	0.33	90.9	9.1	48.0
Nursery Mean	CLUB	61.2	40	10.4	69.2	38.6	0.33	88.5	9.0	50.9
Nursery Standard deviation	CLUB	1.18	5.2	0.64	1.13	2.16	0.018	1.87	0.59	2.16
Standard Mean	SWW	61.7	41	11.1	68.9	33.1	0.32	88.5	9.5	53.1
Nursery Mean	SWW	61.3	37	11.1	67.5	36.5	0.34	85.3	9.6	53.3
Nursery Standard deviation	SWW	0.99	7.8	0.71	1.86	2.26	0.019	2.55	0.51	0.60

SAMPLE#	BREEDER#	MTYPE	CODI	TGS	VISC	RVA
0001	92-109	1M	8.98 -	8	109 -	
0002	92-113	2L	8.96 -	8	56	
0003	92-116	3L	9.71 +	10	53	
0004	92-117	2M	9.35	8	81	
0005	92-118	2M	8.79 -2	7 -	81	
0006	92-122	2L	9.19 -	8	79	
0007	92-125	1M	8.98 -	3 -2	59	
0008	92-129	1M	8.90 -2	7 -	49	
0009	92-137	1M	8.96 -	7 -	46	
0010	92-140	2M	8.86 -2	8	91	
0011	92-148	3L	9.43	9	80	
0012	92-149	2M	9.04 -	8	86	
0013	92-155	3L	9.16 -	8	60	
0014	92-156	4L	9.41	8	80	
0015	92-159	3L	8.99 -	7 -	76	
0016	92-170	2L	9.24	8	80	
0017	92-173	2M	9.14 -	8	108 -	
0018	92-101	4L	9.29	9	48	
0019	92-102	1M	9.35	8	49	
0020	92-103	1L	9.65	8	38	
*0021	92-105	1M	9.45	9	52	
0022	92-191	2M	9.14	6 -	135	
0023	92-195	1M	9.00	5 -2	140	
0024	92-196	2M	9.10	6 -	117	
0025	92-198	2M	9.02	7	144	
0026	92-201	2M	9.01	7	176	
0027	92-202					
0028	92-203	3M	8.81 -	7	179	
*0029	92-204	1M	9.10	8	163	
0030	92-205	3M	9.16	8	141	
0031	92-206	1M	9.07	8	137	

* = standard	mean nursery flour protein = 9.2	mill used = Quad
CLUB		
CLUB	9.45 9 52	
CLUB	9.18 8 70	
	0.258 1.3 20.4	
SWW		
SWW	9.10 8 163	
SWW	9.05 7 148	
SWW	0.105 1.1 20.5	

COMMENTS: Quality parameters of CLUB lines in this nursery were graded by comparison to the standard mean of Paha. Quality parameters of SWW lines in this nursery were graded by comparison to the standard mean of Lewjain. Cookies were baked on all lines. Brookfield viscosity (VISC) was determined on all CLUB lines. Rapid Visco Analyzer (RVA) viscosity was run on all SWW lines. RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0001	LEWJAIN	92-61	SWW	61.1	32	10.2	66.9 -2	37.4	0.31 +2	86.6	8.4	54.9
*0002	HILL 81	92-65	SWW	61.7	32	11.5	71.9	39.0	0.39	87.8	9.7	54.6
*0003	MADSEN	92-66	SWW	61.4	36	10.5	70.2	36.4	0.33	89.5	9.2	55.1
0004	WA7690	92-69	SWW	62.2	36	10.6	68.4 -2	35.2	0.33 +	87.2	8.8	55.6
0005	WA7717	92-70	SWW	60.6	32	10.7	67.5 -2	35.3	0.34	85.4 -	9.3	55.4
0006	WA7691	92-71	SWW	61.5	41	10.0	69.9 -	35.5	0.33 +	89.1	8.3	53.5
0007	84X316 SEL1/DT//820/O/1834/178383// (15)	92-72	SWW	60.1	50	9.9	67.6 -2	34.4	0.35	84.9 -	8.4	54.8
0008	STEPHENS//WA7163/LEWJAIN (85X203) W LBW	92-74	SWW	61.7	32	9.8	67.6 -2	36.7	0.33 +	86.2 -	8.1	54.4
0009	DUSTY//WA7164/WA6912 (85X619) W LBRW	92-77	SWW	61.6	27	10.4	69.1 -	38.3	0.32 +	88.7	8.6	54.4
0010	PK08 S421/VH66354/WA5827/6241//2*H81 W	92-81	SWW	61.9	23	11.0	69.7 -	39.8	0.34	88.2	9.1	54.4
0011	WA7671 (M421/VH66354/WA5827/6241//2*H81)	92-68	SWW	61.5	28	10.5	69.8 -	39.6	0.34	88.3	9.1	54.3

* = standard mean nursery flour protein = 8.8 mill used = Quad

Standard Mean
Nursery Mean
Nursery Standard deviation

Standard Mean	71.1	37.7	0.36	88.7	9.4	54.8
Nursery Mean	69.0	37.1	0.34	87.4	8.8	54.7
Nursery Standard deviation	1.51	1.90	0.021	1.51	0.50	0.58

SAMPLE#	BREEDER#	MTYPE	CODI	TGS	RVA	COLOR*
0001	92-61	2M	9.23	8	171	
*0002	92-65	1M	9.06	8	124	
*0003	92-66	2M	9.00	8	126	
0004	92-69	1M	8.96	7	121	
0005	92-70	1M	8.95	7	145	
0006	92-71	2M	9.16	8	115	S
0007	92-72	3M	8.85	7	117	Q
0008	92-74	2M	9.19	8	131	
0009	92-77	2M	9.09	8	163	
0010	92-81	2M	8.90	8	126	
0011	92-68	2M	9.26	8	141	

* = standard mean nursery flour protein = 8.8 mill used = Quad

SWW	9.03	8	125
SWW	9.06	8	135
SWW	0.139	0.5	18.5

COMMENTS: Quality parameters of SWW selections in this nursery were graded by comparison to the standard mean of Hill 81 and Madsen. Breeder # 92-72 had a NIR wheat hardness value of 50 which makes it questionable being classified as SWW. Rapid Visco Analyzer (RVA) viscosity was determined on all lines. RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable.

Alkaline flour color was determined on Breeder #'s 92-71 and 92-72 since their NIR wheat hardness values were above 40. *Color represents an extremely important quality criterion in Asian types of noodles. A preliminary alkaline flour color test was initiated. An alkaline Pekar slick was used to subjectively measure flour color. The Pekar slick was prepared by pressing flour to a smooth surface, immersing in a 1.0% alkaline solution consisting of 60% K₂CO₃ and 40% Na₂CO₃ for 2 minutes. The sample rested at a room temperature of (77°F) for 4 hours before visual observation and scoring. Flours were scored by the following; S = satisfactory, Q = questionable, and U = unsatisfactory. Desirable flour color ranges from bright white through creamy yellow to bright yellow. Any dullness, brown, or greenish casts would be unacceptable. Alkaline flour color (COLOR) is scored only on SWW, HWW, SWS and HWS wheats which have a minimum RVA viscosity of 150 and a minimum NIR wheat hardness (UWHRD) value of 40.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0001	LEWJAIN	92-61	SWW	57.0	24	11.6	62.6 -2	40.6	0.32 +	80.4 -	10.3	57.1
*0002	HILL 81	92-65	SWW	56.9	23	12.4	64.8	39.5	0.35	81.3	10.7	56.3
*0003	MADSEN	92-66	SWW	57.2	15	11.8	66.9	38.1	0.34	84.6	10.3	56.4
0004	WA7690	92-69	SWW	57.3	22	12.6	64.7 -	37.2	0.34	81.8	10.5	56.4
0005	WA7717	92-70	SWW	56.4	24	12.3	64.1 -	38.7	0.34	81.1	10.5	55.5
0006	WA7691	92-71	SWW	57.1	28	11.9	68.0 +	39.1	0.31 +	88.0 +2	10.2	56.4
0007	84X316 SEL1/DT//820/O/1834/178383// (15)	92-72	SWW	54.8 -	38	12.2	66.0	36.7	0.34	83.5	10.7	56.5
0008	STEPHENS//WA7163/LEWJAIN (85X203) W LBW	92-74	SWW	58.7	24	11.2	65.6	39.1	0.33	83.6	9.9	54.5
0009	DUSTY//WA7164/WA6912 (85X619) W LBRW	92-77	SWW	59.3 +	26	10.8	66.5	40.1	0.34	84.1	9.4	54.2
0010	PK08 S421/VH66354/WA5827/6241//2*H81 W	92-81	SWW	58.0	21	12.5	64.2 -	40.5	0.33	81.8	10.7	56.6
0011	WA7671 (M421/VH66354/WA5827/6241//2*H81)	92-68	SWW	56.7	20	12.1	64.5 -	40.6	0.32 +	82.9	10.5	56.4

* = standard mean nursery flour protein = 10.3 mill used = Quad

Standard Mean	SWW	57.0	19	12.1	65.8	38.8	0.34	83.0	10.5	56.3
Nursery Mean	SWW	57.2	24	11.9	65.3	39.1	0.33	83.0	10.3	56.0
Nursery Standard deviation	SWW	1.19	5.7	0.56	1.52	1.35	0.012	2.13	0.40	0.91

SAMPLE#	BREEDER#	MTYPE	CODI	TGS	RVA	COLOR*
0001	92-61	4M	9.11	7	198	
*0002	92-65	2M	9.06	7	169	
*0003	92-66	2M	8.94	7	162	
0004	92-69	1H	8.97	7	165	
0005	92-70	1M	9.45 +	8	178	
0006	92-71	2M	9.04	7	152	
0007	92-72	2H	8.82	7	161	Q
0008	92-74	2M	9.09	8	172	
0009	92-77	3M	9.32 +	8	186	
0010	92-81	2M	9.14	8	166	
0011	92-68	2M	9.19	7	170	

* = standard mean nursery flour protein = 10.3 mill used = Quad

SWW 9.00 7 166
 SWW 9.10 7 171
 SWW 0.175 0.5 12.7

COMMENTS: Quality parameters of SWW selections in this nursery were graded by comparison to the standard mean of Hill 81 and Madsen. Test weight of the selections in this nursery were from 4 to 5 lbs/bu less than those from FRT (Nursco 96) and Walla Walla (Nursco 98). This resulted in lower flour yield and millings score. RVA Breeder #92-72 had the highest NIR wheat hardness value (38) among the lines in this nursery. Rapid Visco Analyzer (RVA) viscosity was determined on all lines. RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65°C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable.

Alkaline flour color was determined only on Breeder #92-72. *Color represents an extremely important quality criterion in Asian types of noodles. A preliminary alkaline flour color test was initiated. An alkaline Pekar slick was used to subjectively measure flour color. The Pekar slick was prepared by pressing flour to a smooth surface, immersing in a 1.0% alkaline solution consisting of 60% K₂CO₃ and 40% Na₂CO₃ for 2 minutes. The sample rested at a room temperature of (77°F) for 4 hours before visual observation and scoring. Flours were scored by the following; S = satisfactory, Q = questionable, and U = unsatisfactory. Desirable flour color ranges from bright white through creamy yellow to bright yellow. Any dullness, brown, or greenish casts would be unacceptable. Alkaline flour color (COLOR) is scored only on SWW, HWW, SWS and HWS wheats which have a minimum RVA viscosity of 150 and a minimum NIR wheat hardness (UHDRD) value of 40.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0001	LEWJAIN	92-61	SWW	63.6 +	27	12.2 -	65.2 -2	35.5	0.32 +2	83.8 -	10.3	57.8 -
*0002	HILL 81	92-65	SWW	62.0	36	9.0	69.9	36.7	0.36	87.2	8.7	53.9
*0003	MADSEN	92-66	SWW	61.6	33	10.6	69.5	35.5	0.37	86.1	9.3	52.9
0004	WA7690	92-69	SWW	62.1	31	9.8	69.8	35.3	0.40 -	84.5 -	8.7	52.9
0005	WA7717	92-70	SWW	61.3	34	9.0	68.0 -	35.9	0.36	84.8	8.3	52.3
0006	WA7691	92-71	SWW	60.8	31	10.6	69.8	36.5	0.36	87.1	8.8	53.1
0007	84X316 SEL1/DT//820/0/1834/178383// (15)	92-72	SWW	61.5	54	11.6 -	67.6 -	33.6	0.35	84.9	9.9	53.6
0008	STEPHENS//WA7163/LEWJAIN (85X203) W LBW	92-74	SWW	62.2	24	10.8	67.5 -	35.3	0.36	84.1 -	9.5	53.0
0009	DUSTY//WA7164/WA6912 (85X619) W LBRW	92-77	SWW	61.9	37	10.1	68.6	38.8	0.37	84.9	9.2	54.5
0010	PK08 S421/VH66354/WA5827/6241//2*H81 W	92-81	SWW	62.6	40	10.6	71.1 +	35.9	0.34 +	90.0 +	9.8	53.6
0011	WA7671 (M421/VH66354/WA5827/6241//2*H81)	92-68	SWW	62.7	34	11.2	69.9	35.5	0.39 -	85.3	10.5 -	53.5

* = standard mean nursery flour protein = 9.4 mill used = Quad

Standard Mean	SWW	61.8	34	9.8	69.7	36.1	0.37	86.7	9.0	53.4
Nursery Mean	SWW	62.0	35	10.5	68.8	35.9	0.36	85.7	9.4	53.7
Nursery Standard deviation	SWW	0.76	7.8	0.99	1.64	1.26	0.022	1.81	0.71	1.47

SAMPLE#	BREEDER#	MTYPE	COOI	TGS	RVA	COLOR*
0001	92-61	2M	9.21	8	162	
*0002	92-65	2L	9.06	7	142	
*0003	92-66	1M	8.88	7	139	
0004	92-69	1M	8.96	7	127	
0005	92-70	2L	8.95	7	132	
0006	92-71	1M	8.98	7	154	
0007	92-72	1H	8.81	7	134	Q
0008	92-74	1M	8.71	7	155	
0009	92-77	2M	8.99	8	138	
0010	92-81	1M	9.24 +	8	140	U
0011	92-68	1H	8.98	8	148	

* = standard mean nursery flour protein = 9.4 mill used = Quad

SWW 8.97 7 140
 SWW 8.98 7 143
 SWW 0.155 0.5 10.8

COMMENTS: Quality parameters of SWW selections in this nursery were graded by comparison to the standard mean of Hill B1 and Madsen. Breeder #92-72 had a NIR wheat hardness value of 54 which makes it questionable being classified as SWW. Rapid Visco Analyzer (RVA) viscosity was determined on all lines. RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable.

Alkaline flour color was run only on Breeder #'s 92-72 and 92-81 since each had NIR hardness values above 40. *Color represents an extremely important quality criterion in Asian types of noodles. A preliminary alkaline flour color test was initiated. An alkaline Pekar slick was used to subjectively measure flour color. The Pekar slick was prepared by pressing flour to a smooth surface, immersing in a 1.0% alkaline solution consisting of 60% K₂CO₃ and 40% Na₂CO₃ for 2 minutes. The sample rested at a room temperature of (77°F) for 4 hours before visual observation and scoring. Flours were scored by the following; S = satisfactory, Q = questionable, and U = unsatisfactory. Desirable flour color ranges from bright white through creamy yellow to bright yellow. Any dullness, brown, or greenish casts would be unacceptable. Alkaline flour color (COLOR) is scored only on SWW, HWW, SWS and HWS wheats which have a minimum RVA viscosity of 150 and a minimum NIR wheat hardness (UWHRD) value of 40.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0001	WA7671	92PR991	SWW	54.9	25	13.2	72.8	19.6	0.38 -	78.6 -	10.5	55.0
*0002	MADSEN	92PR992	SWW	55.3	28	12.4	71.9	18.3	0.35	82.6	10.3	55.3
0003	HILL 81	92PR993	SWW	56.4	24	13.1	70.6 -	18.1	0.36	78.4 -	10.6	55.3
0004	WA7671 SEL (M421/66354/5827/6241//2*H81)	92PR996	SWW	55.4	14	13.0	73.3 +	17.7	0.38 -	82.0	10.4	55.0
0005	WA7671 SEL (M421/66354/5827/6241//2*H81)	92PR999	SWW	56.4	22	13.5	72.2	17.3	0.36	82.0	11.1	55.6
0006	WA7671 SEL (M421/66354/5827/6241//2*H81)	92PR1005	SWW	56.1	18	12.6	69.9 -	19.1	0.38 -	73.6 -2	10.7	55.3
0007	WA7671 SEL (M421/66354/5827/6241//2*H81)	92PR1011	SWW	55.2	19	13.2	70.3 -	17.5	0.38 -	77.1 -2	10.5	55.3
0008	WA7671 SEL (M421/66354/5827/6241//2*H81)	92PR1014	SWW	54.9	18	12.8	68.9 -2	18.8	0.37 -	72.8 -2	10.7	55.4
0009	WA7671 SEL (M421/66354/5827/6241//2*H81)	92PR1017	SWW	56.3	22	13.7	69.1 -2	17.3	0.38 -	75.0 -2	10.5	55.3

* = standard mean nursery flour protein = 10.6 mill used = Buhler

Standard Mean
Nursery Mean
Nursery Standard deviation

SWW 55.3 12.4 71.9 18.3 0.35 82.6 10.3 55.3
SWW 55.7 13.1 71.0 18.2 0.37 78.0 10.6 55.3
SWW 0.64 0.41 1.61 0.83 0.012 3.71 0.23 0.19

SAMPLE#	BREEDER#	MTYPE	CODI	TGS	CAVOL	SCSCOR	RVA
0001	92PR991	2M	8.60 +	5	1385 +	79	149
*0002	92PR992	2M	8.25	5	1325	75	150
0003	92PR993	2M	8.39	5	1330	77	162
0004	92PR996	2M	8.24	5	1340	77	161
0005	92PR999	2M	8.18	4	1210 -2	66 -	137
0006	92PR1005	2M	8.36	5	1325	75	156
0007	92PR1011	2M	8.39	4	1280 -	74	175
0008	92PR1014	2M	8.32	3 -	1290	73	151
0009	92PR1017	2M	8.32	5	1290	75	172

* = standard mean nursery flour protein = 10.6 mill used = Buhler

SWW 8.25 5 1325 75 150
SWW 8.34 5 1308 75 157
SWW 0.121 0.7 48.8 3.7 11.9

COMMENTS: Quality parameters of SWW selections in this nursery were graded by comparison to the standard mean of Madsen. Cookies and Japanese sponge cakes were baked on all lines. The low sponge cake volume and score for Breeder #92PR999 was checked and verified.

Rapid Visco Analyzer (RVA) viscosity was determined on all lines. RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
*0001	LUKE	92-281	SWW	62.6	41	9.2	64.3	36.1	0.28	85.2	7.9	52.6
0002	86X1107 LUKE//SU185/5*LUKE (W)	92-282	SWW	63.4	31	12.2 -	63.2 -	36.0	0.31 -	81.8 -	9.6 -	55.4 -
0003	86X1107 LUKE//SU185/5*LUKE (W)	92-283	SWW	63.8	30	10.8 -	63.0 -	36.2	0.31 -	81.6 -	8.9	54.7
0004	86X1107 LUKE//SU185/5*LUKE (W)	92-284	SWW	63.6	25	10.5	63.7	37.1	0.30 -	83.1	8.7	54.8
0005	86X1109 LUKE//SU185/5*LUKE (W)	92-285	SWW	58.6 -2	31	10.0	64.2	39.8	0.29	84.4	8.2	53.1
0006	86X1111 LUKE//SU185/5*LUKE (W)	92-286	SWW	63.4	33	9.8	63.8	36.6	0.28	84.5	8.3	53.7
0007	86X1117 LUKE//SU185/5*LUKE (W)	92-287	SWW	63.2	32	9.6	66.3 +	38.8	0.28	87.7 +	7.9	53.1
0008	86X1118 LUKE//SU185/5*LUKE (W)	92-288	SWW	62.7	36	10.5	62.3 -	37.7	0.30 -	81.8 -	8.4	53.8
0009	LEWJAIN	92-289	SWW	60.8 -	30	10.4	64.7	37.6	0.30 -	84.4	8.5	53.5
0010	86X1120 LUKE//SU185/5*LUKE (R)	92-290	SRW	62.3	37	9.9	65.9 +	38.4	0.26 +	88.5 +	8.0	52.6
0011	86X1132 LUKE//SU185/5*LUKE (W)	92-291	SWW	63.5	27	10.2	63.6	35.6	0.27	84.9	8.3	53.6
0012	86X1132 LUKE//SU185/5*LUKE (W)	92-292	SWW	62.3	32	9.8	63.9	38.4	0.30 -	83.4	8.3	52.6
0013	86X1132 LUKE//SU185/5*LUKE (W)	92-293	SWW	63.5	35	12.1 -	61.4 -2	34.6	0.29	80.8 -2	9.5 -	54.9
0014	86X1222 LUKE//SU185/5*LUKE (W)	92-294	SWW	63.4	43	13.0 -2	63.8	34.3	0.29	83.9	10.3 -	55.4 -
0015	86X1222 LUKE//SU185/5*LUKE (W)	92-295	SWW	62.9	30	10.7	65.0	37.8	0.29	85.4	8.8	52.4
0016	86X1226 LUKE//SU185/5*LUKE (W)	92-296	SWW	64.5 +	36	10.9 -	62.8 -	34.4	0.31 -	81.3 -	8.8	53.4
0017	86X1226 LUKE//SU185/5*LUKE (W)	92-297	SWW	63.6	38	10.4	65.7 +	36.2	0.27	87.6 +	8.5	53.5
0018	86X1226 LUKE//SU185/5*LUKE (W)	92-298	SWW	64.0	37	9.9	65.4	37.4	0.30 -	85.3	8.2	53.4
0019	86X1107 LUKE//SU185/5*LUKE (W)	92-299	SWW	60.6 -	25	9.6	65.0	40.2	0.30 -	84.8	7.9	52.5
0020	86X1226 LUKE//SU185/5*LUKE (W)	92-300	SWW	63.1	31	9.7	63.6	37.5	0.30 -	83.0 -	7.9	53.5

* = standard mean nursery flour protein = 8.5 mill used = Quad

[illegible]

SAMPLE#	BREEDER#	MTYPE	CODI	TGS	RVA
*0001	92-281	3L	9.09	7	165
0002	92-282	3M	9.01	8	173
0003	92-283	3M	9.00	8	171
0004	92-284	3M	8.95	7	184
0005	92-285	3L	9.14	7	175
0006	92-286	3M	8.88	7	178
0007	92-287	4L	9.24	7	141
0008	92-288	3L	8.96	5	148
0009	92-289	3M	9.11	8	172
0010	92-290	3L	9.38 +	8	155
0011	92-291	3M	9.07	8	164
0012	92-292	2M	9.62 +2	8	151
0013	92-293	4M	9.11	8	160
0014	92-294	3M	8.88	6	199
0015	92-295	3M	9.61 +	8	162
0016	92-296	3M	9.14	7	159
0017	92-297	3M	9.14	7	164
0018	92-298	3M	9.02	8	133
0019	92-299	3L	9.35 +	8	194
0020	92-300	3L	9.15	8	156

* = standard mean nursery flour protein = 8.5 mill used = Quad

SWW	9.09	7	165
SWW	9.14	8	167
SWW	0.208	0.6	16.6
SWW	9.09	7	165
SRW	9.38	8	155

COMMENTS: Quality parameters of SWW selections in this nursery were graded by comparison to the standard mean of Luke. Breeder #92-290 had red seed coat color and was classified as SRW. Cookies were baked on all lines. Rapid Visco Analyzer (RVA) viscosity was determined on all lines. RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable.

* = standard
* = standard
mean nursery flour protein = 10.7 mill used = quad

Nursery Mean

Nursery Mean

SAMPLE#	BREEDER#	MTYPE	CODI	TGS	RVA
*0001	92-281	3M	8.98	8	184
0002	92-282	3M	8.74	6 -	134
0003	92-283	3M	9.04	7	156
0004	92-284	2M	8.77	5 -2	179
0005	92-285	2M	9.18	8	187
0006	92-286	2M	8.80	4 -2	193
0007	92-287	2M	8.91	5 -2	158
0008	92-288	3M	8.74	6 -	144
0009	92-289	2H	8.60 -	6 -	174
0010	92-290	2M	8.77	5 -2	162
0011	92-291	2M	8.94	5 -2	159
0012	92-292	2M	9.01	5 -2	182
0013	92-293	2M	8.59 -	6 -	146
0014	92-294	3M	9.00	7	185
0015	92-295	3M	8.95	4 -2	170
0016	92-296	3M	8.91	6 -	163
0017	92-297	3M	9.05	8	194
0018	92-298	3M	9.02	7	167
0019	92-299	3M	8.99	7	218
0020	92-300	3M	8.95	7	185

* = standard mean nursery flour protein = 10.7 mill used = Quad

SWW	8.98	8	184
SWW	8.90	6	173
SWW	0.157	1.3	20.5
SRW	8.98	8	184
SRW	8.77	5	162

COMMENTS: Quality parameters of SWW selections in this nursery were graded by comparison to the standard mean of Luke. Breeder #92-290 had red seed coat color and was classified as SRW. Test weight of all selections in this nursery were considerably lower than those in Nursco 100 and 102. This contributed to lower flour yield and milling score. Cookies were baked on all lines. Wheat and flour protein content of all selections was considerably higher and cookie diameter was smaller than those in Nursco 100 and 102. Rapid Visco Analyzer (RVA) viscosity was determined on all lines. RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65°C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
*0001	LUKE	92-281	SHW	62.4	45	9.8	67.2	36.8	0.33	85.7	8.0	51.8
0002	86X1107 LUKE//SU185/5*LUKE (W)	92-282	SHW	62.9	35	10.6	66.4	37.5	0.32	85.3	8.8	52.9
0003	86X1107 LUKE//SU185/5*LUKE (W)	92-283	SHW	63.5	34	10.1	67.2	37.2	0.31 +	86.9	8.3	52.0
0004	86X1107 LUKE//SU185/5*LUKE (W)	92-284	SHW	62.7	35	9.9	65.0 -	36.6	0.31 +	84.1	8.0	53.3
0005	86X1109 LUKE//SU185/5*LUKE (W)	92-285	SHW	62.2	37	10.4	66.0 -	39.9	0.32	84.8	8.4	52.1
0006	86X1111 LUKE//SU185/5*LUKE (W)	92-286	SHW	63.3	31	10.4	67.3	37.8	0.33	85.8	8.2	52.1
0007	86X1117 LUKE//SU185/5*LUKE (W)	92-287	SHW	63.5	31	10.3	67.9	37.3	0.31 +	87.8 +	8.3	52.0
0008	86X1118 LUKE//SU185/5*LUKE (W)	92-288	SHW	61.9	40	10.6	66.9	37.8	0.34	84.6	8.4	53.1
0009	LEWJAIN	92-289	SHW	62.5	29	10.5	65.7 -	38.2	0.35	82.5 -	8.4	52.1
0010	86X1120 LUKE//SU185/5*LUKE (R)	92-290	SRW	61.2	31	10.4	66.9	37.8	0.27 +2	89.1 +	8.4	53.0
0011	86X1132 LUKE//SU185/5*LUKE (W)	92-291	SHW	60.2 -	34	11.3	64.8 -2	36.8	0.31 +	83.9	9.1	53.1
0012	86X1132 LUKE//SU185/5*LUKE (W)	92-292	SHW	61.1	37	12.6 -	63.5 -2	38.0	0.34	80.3 -2	9.7 -	54.5 -
0013	86X1132 LUKE//SU185/5*LUKE (W)	92-293	SHW	63.1	34	11.2	63.6 -2	35.6	0.28 +2	84.3	9.1	54.1
0014	86X1222 LUKE//SU185/5*LUKE (W)	92-294	SHW	63.3	40	11.6 -	66.5	35.9	0.27 +2	88.6 +	9.3	53.9
0015	86X1222 LUKE//SU185/5*LUKE (W)	92-295	SHW	63.2	33	10.0	66.4	37.2	0.28 +2	87.8 +	8.3	51.9
0016	86X1226 LUKE//SU185/5*LUKE (W)	92-296	SHW	64.1	36	10.9	66.9	35.4	0.29 +2	87.8 +	8.7	52.9
0017	86X1226 LUKE//SU185/5*LUKE (W)	92-297	SHW	63.3	42	10.0	67.7	37.8	0.27 +2	90.1 +2	8.2	53.1
0018	86X1226 LUKE//SU185/5*LUKE (W)	92-298	SHW	63.4	40	10.3	67.2	37.2	0.29 +2	88.2 +	8.3	52.3
0019	86X1107 LUKE//SU185/5*LUKE (W)	92-299	SHW	61.8	26	10.3	67.1	40.1	0.28 +2	88.7 +	8.2	53.0
0020	86X1226 LUKE//SU185/5*LUKE (W)	92-300	SHW	63.5	38	10.8	64.7 -2	36.5	0.29 +2	85.0	8.3	53.3

* = standard mean nursery flour protein = 8.5 mill used = Quad

Standard Mean												
Nursery Mean	86X1107	LUKE//SU185/5*LUKE (W)	92-299	SHW	61.8	26	10.3	67.1	40.1	0.28 +2	88.7 +	8.2
Nursery Standard deviation	86X1226	LUKE//SU185/5*LUKE (W)	92-300	SHW	63.5	38	10.8	64.7 -2	36.5	0.29 +2	85.0	8.3
Standard Mean												
Nursery Mean	86X1111	LUKE//SU185/5*LUKE (W)	92-286	SHW	63.3	31	10.4	67.3	37.8	0.33	85.8	8.2
Nursery Standard deviation	86X1118	LUKE//SU185/5*LUKE (W)	92-288	SHW	61.9	40	10.6	66.9	37.8	0.34	84.6	8.4

SAMPLE#	BREEDER#	MTYPE	COOI	TGS	RVA
*0001	92-281	2M	9.36	9	166
0002	92-282	2M	9.07 -	8	186
0003	92-283	2M	9.24	8	195
0004	92-284	2L	9.55	8	189
0005	92-285	2M	9.26	8	139
0006	92-286	2M	9.05 -	8	167
0007	92-287	2M	9.25	8	155
0008	92-288	2M	9.00 -	8	146
0009	92-289	2M	9.36	8	141
0010	92-290	2M	9.15	8	172
0011	92-291	2M	9.26	8	156
0012	92-292	3M	9.14	7 -	131
0013	92-293	3M	9.39	8	185
0014	92-294	2M	9.41	8	238
0015	92-295	2M	9.16	8	186
0016	92-296	2M	9.09 -	8	188
0017	92-297	2M	9.21	8	174
0018	92-298	2M	9.19	7 -	153
0019	92-299	2M	9.23	7 -	170
0020	92-300	2M	9.11	7 -	172

* = standard mean nursery flour protein = 8.5 mill used = Quad

SWW	9.36	9	166
SWW	9.23	8	170
SWW	0.141	0.5	25.1
SWW	9.36	9	166
SRW	9.15	8	172
SRW			

COMMENTS: Quality parameters of SWW selections in this nursery were graded by comparison to the standard mean of Luke. Breeder #92-290 had red seed coat color and was classified as SRW. Cookies were baked on all lines. Rapid Visco Analyzer (RVA) viscosity was determined on all lines. RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
*0001	Klasic	1	HWS	63.0	63	13.6	66.5	9.9	0.35	72.5	12.4	63.5
0002	OR 484013	2	HWS	62.5	75	13.0	73.9 +2	9.1	0.39 -	81.9 +2	11.7	62.5
0003	OR4870279	3	HWS	62.1	54	13.7	68.4 +	10.8	0.38 -	75.3 +	12.3	63.6
0004	OR4870453	4	HWS	62.0	73	12.9	68.4 +	8.2	0.40 -2	74.8 +	11.7	63.7
0005	OR4870255	5	HWS	61.9	58	13.3	68.9 +2	10.5	0.34	79.0 +2	11.8	62.5
0006	OR4870374	6	HWS	60.9 -	50	13.0	70.7 +2	9.9	0.33	79.5 +2	11.7	59.5 -
0007	OR4880278	7	HWS	62.3	71	13.2	65.3 -	9.3	0.43 -2	69.6 -	11.5	57.4 -2
0008	OR4880391	8	HWS	60.6 -	65	13.0	69.2 +2	8.5	0.40 -2	73.9	11.5	58.4 -
0009	OR4880403	9	HWS	61.4	72	12.8	68.2 +	9.0	0.39 -	73.9	11.5	59.3 -
0010	OR4895143	10	HWS	60.9 -	69	13.2	67.2	9.2	0.39 -	71.5	11.7	59.3 -
0011	OR4880536	11	HRS	63.3	69	13.1	66.1	8.3	0.41 -2	70.0 -	12.0	57.4 -2
0012	OR3865306	12	HWS	62.0	79	13.4	64.7 -	9.0	0.41 -2	69.2 -	12.1	57.8 -2
0013	OR4880331	13	HWS	62.2	70	13.8	65.6	9.8	0.40 -2	70.4	12.0	59.3 -
0014	OR4880372	14	HWS	62.3	79	13.1	69.2 +2	8.8	0.41 -2	73.8	12.2	57.1 -2
0015	OR4880406	15	HWS	61.4	76	13.5	68.7 +	9.0	0.44 -2	71.5	12.6	56.9 -2
0016	OR4895175	16	HWS	62.8	71	13.8	69.0 +2	11.5	0.38 -	75.4 +	12.2	56.4 -2
0017	OR4895181	17	HWS	61.1 -	76	12.5	69.9 +2	10.6	0.42 -2	74.6	11.5	58.9 -
0018	OR4895207	18	HWS	62.3	78	12.7	70.3 +2	10.3	0.38 -	78.2 +2	11.7	58.1 -2
0019	OR4880514	19	HWS	61.6	64	13.6	63.0 -2	7.6	0.40 -2	66.0 -2	12.0	57.6 -2
0020	OR4895222	20	HWS	61.1 -	73	13.7	60.8 -2	7.0	0.39 -	62.3 -2	12.2	58.7 -
0021	OR4895224	21	SWS	61.5	29	13.4	69.6 +2	16.8	0.33	79.8 +2	11.3	55.8 -2
0022	OR4880296	22	HWS	61.5	75	13.5	65.6	9.1	0.38 -	70.9	12.0	60.9
0023	OR4880348	23	HWS	62.2	68	12.6	65.4	10.3	0.38 -	72.4	11.6	60.3 -
0024	OR4880395	24	HWS	61.6	75	13.5	64.5 -	9.1	0.39 -	69.0 -	12.2	62.3
0025	OR 488528	25	HWS	62.8	60	13.8	69.2 +2	9.6	0.36	77.5 +2	11.6	62.6
0026	SERI 82	26	HWS	61.3 -	69	12.4	65.0 -	8.1	0.38 -	68.9 -	11.4	59.4 -

* = standard mean nursery flour protein = 11.9 mill used = Buhler

Standard Mean	HWS	63.0	63	13.6	66.5	9.9	0.35	72.5	12.4	63.5
Nursery Mean	HWS	61.8	69	13.2	67.4	9.3	0.39	73.0	11.9	59.8
Nursery Standard deviation	HWS	0.66	7.8	0.43	2.85	1.05	0.026	4.48	0.34	2.31
Standard Mean	HWS	63.0	63	13.6	66.5	9.9	0.35	72.5	12.4	63.5
Nursery Mean	HRS	63.3	69	13.1	66.1	8.3	0.41	70.0	12.0	57.4
Standard Mean	HWS	63.0	63	13.6	66.5	9.9	0.35	72.5	12.4	63.5
Nursery Mean	SWS	61.5	29	13.4	69.6	16.8	0.33	79.8	11.3	55.8

SAMPLE#	BREEDER#	MTYPE	BABS	MTIME	LVOL	BCRGR	PROQ	RVA	COLOR*
*0001	1	5H	65.7	5.4	1075	4	+1	240	Q
0002	2	4H	65.7	3.3 -	935 -2	4	+1	189	Q
0003	3	4H	65.8	4.4	1045	3	+1	241	Q
0004	4	5H	65.9	4.3	925 -2	5	0	194	Q
0005	5	4H	66.7	4.1 -	1005 -	5	+1	213	Q
0006	6	5H	62.7 -	4.1 -	975 -2	5	+1	183	S
0007	7	3H	61.6 -	3.5 -	815 -2	7	-1	158	Q
0008	8	4H	61.6 -	4.3	890 -2	5	0	131	S
0009	9	2H	63.0 -	2.9 -	905 -2	8	0	112	S
0010	10	3H	63.5	2.6 -2	860 -2	8	-1	122	Q
0011	11	2H	63.6	2.0 -2	785 -2	8	-1	152	S
0012	12	2H	64.0	2.2 -2	790 -2	8	-1	136	Q
0013	13	2H	63.5	2.4 -2	935 -2	4	0	164	Q
0014	14	2H	61.3 -	2.4 -2	835 -2	8	-1	177	S
0015	15	2H	61.1 -	2.2 -2	870 -2	7	-1	181	Q
0016	16	2H	60.6 -2	2.0 -2	845 -2	8	-1	166	Q
0017	17	3H	63.1 -	3.5 -	910 -2	6	0	201	U
0018	18	2H	62.3 -	1.7 -2	785 -2	8	-1	128	Q
0019	19	3H	63.3 -	3.3 -	855 -2	6	-1	156	S
0020	20	2H	64.9	2.8 -2	895 -2	7	-1	161	S
0021	21	3H	60.0 -2	2.6 -2	940 -2	6	+1	185	U
0022	22	3H	67.1	3.6 -	940 -2	8	0	187	S
0023	23	2H	64.5	2.1 -2	875 -2	5	0	122	S
0024	24	3H	66.5	3.1 -	950 -2	4	0	179	Q
0025	25	3H	66.8	2.8 -2	870 -2	4	0	160	S
0026	26	3H	63.6	3.0 -	865 -2	6	0	123	S

* = standard mean nursery flour protein = 11.9 mill used = Buhler

HWS	65.7	5.4	1075	4	240
HWS	64.0	3.2	902	6	168
HWS	2.01	0.92	73.0	1.7	35.8
HWS	65.7	5.4	1075	4	240
HRS	63.6	2.0	785	8	152
HWS	65.7	5.4	1075	4	240
SWS	60.0	2.6	940	6	185

COMMENTS: Quality parameters of HWS selections in this nursery were graded by comparison to the standard mean of Klasic. Breeder #21 had NIR wheat hardness value less than 50 and was classified as SWS. Several lines had exceptionally higher flour yield than Klasic. Overall, milling scores of most lines were low. This was due to low patent flour yield caused mostly by poor reduction properties (hard endosperm). Several lines had poor absorption (as determined by the mixograph) and short mixing time compared to the standard mean of Klasic. Nearly all selections had inferior loaf volume and several had questionable to poor crumb grain score compared to that of Klasic. Loaf volume of several lines was acceptable for their flour protein content, as graded by their Protein Quality (PROQ) rating. The mean nursery flour protein content was 11.9%; at this level, one should expect a volume of near 915 cc if the protein is of good quality.

Rapid Visco Analyzer (RVA) viscosity was determined on all lines. RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable.

Alkaline flour color (COLOR) was scored on all lines. *Color represents an extremely important quality criterion in Asian types of noodles. A preliminary alkaline flour color test was initiated. An alkaline Pekar slick was used to subjectively measure flour color. The Pekar slick was prepared by pressing flour to a smooth surface, immersing in a 1.0% alkaline solution consisting of 60% K₂CO₃ and 40% Na₂CO₃ for 2 minutes. The sample rested at a room temperature of (77°F) for 4 hours before visual observation and scoring. Flours were scored by the following; S = satisfactory, Q = questionable, and U = unsatisfactory. Desirable flour color ranges from bright white through creamy yellow to bright yellow. Any dullness, brown, or greenish casts would be unacceptable. Alkaline flour color (COLOR) is scored only on SWS, HWS, SWS and HWS wheats which have a minimum RVA viscosity of 150 and a minimum NIR wheat hardness (UWHRD) value of 40.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0001	CMH73A.497/2*CN079	92023/4	HRS	62.9	73	13.0	62.9 -2	26.0	0.38 -	78.2 -2	11.1	62.7 +
*0002	KLASIC	92023/5	HWS	62.2	48	13.2	69.6	32.3	0.30	89.4	11.9	60.4
0003	GEN*3/PRL"S"	92023/8	SWS	62.3	40	13.4	66.9 -2	41.0	0.30	87.2 -	11.3	58.1
0004	SER1*3//RL6010/4*YR	92023/10	HWS	60.6	62	12.4	62.9 -2	23.8	0.33 -	80.8 -2	11.2	56.9 -
0005	BR12*4//BH1146*6/ALD"S"	92023/12	SWS	62.1	46	12.7	66.4 -2	37.9	0.26 +2	89.1	11.1	55.5 -
0006	YECORA ROJO	92023/13	HRS	61.6	69	14.0 +	64.6 -2	26.7	0.33	82.6 -	12.4	59.5
0007	F6.74/BUN'S'//SIS'S'	92023/18	HWS	62.7	72	13.9	66.1 -2	31.6	0.31	85.2 -2	12.1	59.5
0008	SPE1"S"	92023/23	HRS	64.4 +	89	12.7	63.9 -2	25.8	0.31 +	82.9	11.7	58.3
*0009	SERRA	92023/29	HRS	62.1	62	12.2	67.2	32.0	0.34	84.8	11.4	57.7
0010	BOW'S'/NKT'S'	92023/30	HRS	63.6	69	12.6	66.0 -	30.0	0.25 +2	88.3 +	11.0	58.5

* = standard mean nursery flour protein = 11.5 mill used = Quad

Standard Mean	HRS	62.1	62	12.2	67.2	32.0	0.34	84.8	11.4	57.7
Nursery Mean	HRS	62.9	72	12.9	64.9	28.1	0.32	83.4	11.5	59.3
Nursery Standard deviation	HRS	1.13	10.1	0.68	1.70	2.76	0.048	3.67	0.56	1.99
Standard Mean	HWS	62.2	48	13.2	69.6	32.3	0.30	89.4	11.9	60.4
Nursery Mean	HWS	61.8	61	13.2	66.2	29.2	0.31	85.1	11.7	58.9
Nursery Standard deviation	HWS	1.10	12.1	0.75	3.35	4.72	0.015	4.30	0.47	1.82
Standard Mean	HWS	62.2	48	13.2	69.6	32.3	0.30	89.4	11.9	60.4
Nursery Mean	SWS	62.2	43	13.1	66.7	39.5	0.28	88.2	11.2	56.8
Nursery Standard deviation	SWS	0.14	4.2	0.49	0.35	2.19	0.028	1.34	0.14	1.84

SAMPLE#	BREEDER#	MTYPE	BABS	MTIME	LVOL	BCRGR	PROQ
0001	92023/4	3H	64.9 +	3.9 -	925	4	+1
*0002	92023/5	6H	62.6	5.8	1015	3	+1
0003	92023/8	5H	60.3	5.8	1010	2	+1
0004	92023/10	3H	59.1 -	3.4 -	920 -2	5	+1
0005	92023/12	5H	57.7 -2	4.8	955 -	3	+1
0006	92023/13	6H	63.7 +	5.8	960	3	0
0007	92023/18	3H	61.7	3.3 -	935 -	5	0
0008	92023/23	4H	63.0	3.7 -2	965	5	+1
*0009	92023/29	6H	60.9	6.4	930	2	+1
0010	92023/30	5H	60.7	4.4 -	815 -2	6	-1

* = standard mean nursery flour protein = 11.5 mill used = Quad

HRS	60.9	6.4	930	2
HRS	62.6	4.8	919	4
HRS	1.81	1.20	60.8	1.6
HWS	62.6	5.8	1015	3
HWS	61.1	4.2	957	4
HWS	1.82	1.42	51.1	1.2
HWS	62.6	5.8	1015	3
SWS	59.0	5.3	982	2
SWS	1.84	0.71	38.9	0.7

COMMENTS: Quality parameters of HWS and SWS selections in this nursery were graded by comparison to the standard mean of Klasic. Quality parameters of HRS selections in this nursery were graded by comparison to the standard mean of Serra. Breeder #'s 92023/8 and 92023/12 had NIR wheat hardness value less than 50 and were classified as SWS. Klasic had a NIR wheat hardness value of 48, however commercially, it is recognized and classified as HWS. Bread was baked on all lines. One concern often heard about Klasic from some of the U.S. commercial milling trade is its low baking (water) absorption. This is also a concern for future hard white and red variety releases.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0001	PFAU"S"/SERI//BOW"S"	92024/6	HWS	64.2 +	93	12.3	64.2 -2	25.9	0.33 -2	82.2 -2	10.7	60.2
0002	TOB"S"/8156//Y50E/3*KAL/4/MRS//KAL/BB/3/	92024/7	HRS	62.5	74	14.0	63.4 -2	26.8	0.30	82.9 -	11.7	59.2
0003	YOLO	92024/8	HRS	62.3	76	12.6	67.3	30.8	0.31	86.5	10.8	58.1
0004	ALD'S'xPAVON 76'S'	92024/10	HWS	62.0	70	13.3	62.5 -2	25.0	0.37 -2	78.3 -2	11.0	59.2
0005	MON"S"-ALD"S'	92024/12	HRS	63.5	94	14.2	58.6 -2	24.9	0.29 +	78.4 -2	12.0	62.6 +
0006	VEE'S'/3/KLTO'S'/PAT19//MO/JUP	92024/14	HWS	63.3	81	14.6	64.8 -2	25.4	0.30	84.4 -	11.9	58.0
0007	F6.74/BUN'S'//SIS'S'	92024/16	HWS	63.1	87	13.4	58.4 -2	22.2	0.33 -2	76.1 -2	11.1	60.0
*0008	SERRA	92024/17	HRS	62.0	63	12.9	67.1	32.9	0.32	85.8	11.1	59.0
0009	PRL'S'/VEE#6	92024/21	HWS	62.2	79	12.4	65.2 -2	30.7	0.34 -2	82.7 -2	10.9	60.1
0010	YECORA ROJO	92024/22	HRS	62.2	61	14.4	65.0 -	26.8	0.32	83.6 -	11.9	61.5
0011	VEE"S"/JUN"S"	92024/26	HWS	63.1	66	13.0	60.1 -2	25.0	0.30	79.5 -2	11.3	59.4
*0012	KLASIC	92024/29	HWS	62.4	57	13.5	67.6	31.4	0.29	87.8	11.7	59.9
0013	VEE#S"S"/3/GOV/AZ//MUS"S"	92024/30	HRS	64.1 +	87	14.3	58.5 -2	25.1	0.28 +	78.9 -2	11.9	61.9 +
0014	BOW"S"/MON"S"/ALD"S"	92024/31	HRS	63.7 +	92	13.9	58.4 -2	25.1	0.28 +	78.8 -2	11.8	64.2 +

* = standard mean nursery flour protein = 11.4 mill used = Quad

Standard Mean	HWS	62.4	57	13.5	67.6	31.4	0.29	87.8	11.7	59.9
Nursery Mean	HWS	62.9	76	13.2	63.3	26.5	0.32	81.6	11.2	59.5
Nursery Standard deviation	HWS	0.76	12.5	0.77	3.16	3.32	0.028	3.95	0.43	0.77
Standard Mean	HRS	62.0	63	12.9	67.1	32.9	0.32	85.8	11.1	59.0
Nursery Mean	HRS	62.9	78	13.8	62.6	27.5	0.30	82.1	11.6	60.9
Nursery Standard deviation	HRS	0.84	13.3	0.71	4.07	3.14	0.017	3.43	0.46	2.22

SAMPLE#	BREEDER#	MTYPE	BABS	MTIME	LVOL	BCRGR	PROG
0001	92024/6	5H	63.4	4.2 -	915 -	4	+1
0002	92024/7	3H	61.4	3.3 -2	865 -2	6	-1
0003	92024/8	2H	60.3	2.0 -2	890 -	5	+1
0004	92024/10	3H	63.4	3.2 -2	870 -2	6	0
0005	92024/12	5H	65.8 +	5.7	835 -2	5	-1
0006	92024/14	4H	60.2	4.1 -	860 -2	5	-1
0007	92024/16	2H	62.2	2.6 -2	835 -2	7	-1
*0008	92024/17	6H	62.2	6.2	950	3	+1
0009	92024/21	4H	62.3	4.4 -	870 -2	5	0
0010	92024/22	5H	63.7	5.6	925	2	0
0011	92024/26	3H	61.6	3.3 -2	835 -2	8	-1
*0012	92024/29	5H	62.1	6.1	980	5	+1
0013	92024/30	6H	67.1 +2	5.2	815 -2	5	-1
0014	92024/31	6H	69.4 +2	5.5	850 -2	5	-1

* = standard mean nursery flour protein = 11.4 mill used = Quad

HWS	62.1	6.1	980	5
HWS	62.2	4.0	881	6
HWS	1.10	1.13	51.4	1.4
HRS	62.2	6.2	950	3
HRS	64.3	4.8	876	4
HRS	3.30	1.54	48.8	1.4

COMMENTS: Quality parameters of HRS selections in this nursery were graded by comparison to the standard mean of Serra. Quality parameters of HWS selections were graded by comparison to the standard mean of Klasic. Bread was baked on all lines. One concern often heard about Klasic from some of the U.S. commercial milling trade is its low baking (water) absorption. This is also a concern for future hard white and red variety releases.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0001	[(ANZaxSARIC 70)xKLASIC]x(JUP-EMUSxGJO'S	39/2	HRS	61.7	66	12.5	68.3 +	33.0	0.31	87.5	10.5	60.8
0002	[(ANZaxSARIC 70)xKLASIC]x(JUP-EMUSxGJO'S	39/3	HRS	61.6	67	12.1	68.9 +2	33.4	0.33	87.1	10.8	60.0
0003	[(ANZaxSARIC 70)xKLASIC]x(JUP-EMUSxGJO'S	39/4	HRS	62.6	77	13.5	67.7 +	31.5	0.30	87.4	12.1	62.4 +
0004	[(ANZaxSARIC 70)xKLASIC]x(JUP-EMUSxGJO'S	39/5	HRS	63.1	60	13.1	66.8	31.7	0.32	85.4	11.6	57.9
0005	[(ANZaxSARIC 70)xKLASIC]x(JUP-EMUSxGJO'S	39/7	HRS	63.1	77	12.1	69.3 +2	33.4	0.29 +	89.6 +	10.6	59.0
0006	[(ANZaxSARIC 70)xKLASIC]x(JUP-EMUSxGJO'S	39/9	HRS	63.4	87	12.4	65.2 -	26.6	0.35 -	82.2 -	11.0	60.1
0007	[(ANZaxSARIC 70)xKLASIC]x(JUP-EMUSxGJO'S	39/11	HRS	64.1 +	70	13.9	66.9	33.5	0.31	86.1	12.2	59.9
0008	[(ANZaxSARIC 70)xKLASIC]x(JUP-EMUSxGJO'S	39/19	HWS	63.4	63	12.0	67.3	34.2	0.30	87.0	10.8	59.0
0009	[(ANZaxSARIC 70)xKLASIC]x(JUP-EMUSxGJO'S	39/21	HRS	62.5	75	12.3	67.0	33.8	0.31	86.2	11.2	61.0
0010	[(ANZaxSARIC 70)xKLASIC]x(JUP-EMUSxGJO'S	39/22	HWS	63.4	68	12.3	66.9	34.6	0.28 +	87.6 +	10.9	60.9
0011	[(ANZaxSARIC 70)xKLASIC]x(JUP-EMUSxGJO'S	39/23	HRS	64.9 +	78	12.9	63.0 -2	25.9	0.27 +2	84.1	11.1	
0012	[(ANZaxSARIC 70)xKLASIC]x(JUP-EMUSxGJO'S	39/24	HRS	63.7 +	76	11.9	69.5 +2	32.8	0.31	88.8 +	10.9	58.6
0013	[(ANZaxSARIC 70)xKLASIC]x(JUP-EMUSxGJO'S	39/25	HRS	62.7	69	11.9	68.4 +	32.8	0.29 +	88.7 +	10.8	59.0
0014	[(ANZaxSARIC 70)xKLASIC]x(JUP-EMUSxGJO'S	39/28	HRS	63.6	75	12.5	66.3	30.9	0.32	84.9	11.4	61.6
0015	YECORA ROJO	39/30	HRS	62.2	70	13.0	64.1 -2	26.1	0.33	82.1 -	11.4	61.9
0016	YOLO	39/31	HRS	62.6	67	12.0	66.7	29.9	0.32	85.3	10.4	57.0
0017	[(ANZaxSARIC 70)xKLASIC]x(JUP-EMUSxGJO'S	39/32	HRS	63.1	73	14.0	65.7	30.8	0.28 +	86.4	11.9	59.9
0018	[(ANZaxSARIC 70)xKLASIC]x(JUP-EMUSxGJO'S	39/36	HWS	62.5	84	12.9	66.4	31.8	0.30	86.1	11.6	61.2
0019	[(ANZaxSARIC 70)xKLASIC]x(JUP-EMUSxGJO'S	39/37	HRS	64.6 +	84	12.5	63.2 -2	26.2	0.31	82.2 -	10.9	
0020	[(ANZaxSARIC 70)xKLASIC]x(JUP-EMUSxGJO'S	39/39	HRS	62.6	71	13.6	66.1	31.9	0.30	85.8	11.9	62.1 +
0021	[(ANZaxSARIC 70)xKLASIC]x(JUP-EMUSxGJO'S	39/45	HRS	64.4 +	76	13.6	67.4	33.7	0.27 +2	88.7 +	11.7	62.0 +
0022	[(ANZaxSARIC 70)xKLASIC]xYECORA ROJO	39/58	HRS	63.1	73	14.1	65.0 -	30.7	0.30	84.6	12.6 +	62.9 +
*0023	KLASIC	39/60	HWS	62.9	65	12.9	66.5	30.4	0.31	85.6	11.3	60.4
*0024	SERRA	39/61	HRS	61.9	61	12.8	66.7	31.0	0.31	85.9	11.0	59.8
0025	[(ANZaxSARIC 70)xKLASIC]xYECORA ROJO	39/65	HRS	62.0	75	12.6	60.8 -2	22.9	0.34 -	78.1 -2	10.8	
0026	[(ANZaxSARIC 70)xKLASIC]xYECORA ROJO	39/66	HRS	62.5	66	13.6	63.5 -2	21.6	0.32	82.0 -	11.5	
0027	[(ANZaxSARIC 70)xKLASIC]xYECORA ROJO	39/75	HRS	61.9	72	12.8	63.1 -2	26.1	0.33	81.1 -2	11.2	
0028	[(MENOX8156)x((TOBxFN)xBB))xKLASIC]xSGY	39/78	HRS	63.6	72	12.4	66.2	30.0	0.31	85.3	11.1	59.7
0029	[(MENOX8156)x((TOBxFN)xBB))xKLASIC]xSGY	39/79	HRS	63.7 +	83	12.2	65.7	29.4	0.32	84.3	10.9	59.8
0030	[(MENOX8156)x((TOBxFN)xBB))xKLASIC]xSGY	39/84	HWS	63.3	52	14.0	67.6 +	33.1	0.28 +	88.4 +	11.5	60.9
0031	[(MENOX8156)x((TOBxFN)xBB))xKLASIC]xSGY	39/87	HRS	63.1	70	13.6	65.3 -	30.2	0.28 +	86.0	11.4	61.4
0032	[(MENOX8156)x((TOBxFN)xBB))xKLASIC]xSGY	39/89	HRS	62.9	82	12.9	67.2	30.4	0.29 +	87.4	10.9	61.2
0033	[(MENOX8156)x((TOBxFN)xBB))xKLASIC]xSGY	39/92	HRS	63.0	69	12.5	66.3	30.5	0.29 +	86.5	11.1	59.9
0034	[(MENOX8156)x((TOBxFN)xBB))xKLASIC]xSGY	39/93	HRS	63.8 +	67	12.9	66.6	30.0	0.28 +	87.3	11.3	60.9
0035	[(MENOX8156)x((TOBxFN)xBB))xKLASIC]xSGY	39/97	HWS	63.1	56	13.0	67.9 +	33.9	0.28 +	88.7 +	11.3	59.9
0036	[(MENOX8156)x((TOBxFN)xBB))xKLASIC]xSGY	39/99	HWS	62.9	68	12.3	68.0 +	33.8	0.29 +	88.3 +	11.2	59.0
0037	[(MENOX8156)x((TOBxFN)xBB))xKLASIC]xSGY	39/100	HRS	64.5 +	74	13.6	66.1	29.8	0.26 +2	87.8 +	11.8	60.8
0038	[(MENOX8156)x((TOBxFN)xBB))xKLASIC]xSGY	39/104	HRS	64.5 +	66	14.0	66.5	31.3	0.26 +2	88.3 +	12.4 +	62.3 +
0039	[(MENOX8156)x((TOBxFN)xBB))xKLASIC]xSGY	39/105	HRS	63.3	84	12.8	66.7	31.2	0.29 +	86.9	11.6	60.9
0040	[(MENOX8156)x((TOBxFN)xBB))xKLASIC]xSGY	39/107	HRS	63.0	89	13.2	64.3 -	29.2	0.29 +	84.4	11.6	60.0

* = standard mean nursery flour protein = 11.8 mill used = quad

SAMPLE#	BREEDER#	MTYPE	BABS	MTIME	LVOL	BCRGR	PROQ
0001	39/2	5H	63.0	4.5 -2	990 +	3	+1
0002	39/3	4H	63.2	3.9 -2	990 +	3	+1
0003	39/4	4H	64.6 +	3.9 -2	975	5	+1
0004	39/5	5H	62.1	4.8 -2	945	5	+1
0005	39/7	6H	61.2	6.9	885 -	5	+1
0006	39/9	3H	63.8	3.3 -2	925	6	+1
0007	39/11	2H	61.6	2.4 -2	975	4	+1
0008	39/19	7H	61.2	8.3 +	950 -	6	+1
0009	39/21	6H	63.2	8.0	940	7	+1
0010	39/22	6H	63.1	8.9 +2	980 -	5	+1
0011	39/23						
0012	39/24	4H	60.8	4.3 -2	1015 +	4	+1
0013	39/25	5H	61.0	5.1 -2	995 +	3	+1
0014	39/28	3H	64.8 +	3.6 -2	1055 +2	5	+1
0015	39/30	6H	65.0 +	6.1 -	940	4	+1
0016	39/31	2H	59.2 -	2.5 -2	925	6	+1
0017	39/32	3H	62.1	3.2 -2	1000 +	4	+1
0018	39/36	1H	63.4	4.2 -	980 -	4	+1
0019	39/37						
0020	39/39	4H	62.8	6.0 -	985	2	+1
0021	39/45	5H	64.2	4.6 -2	995 +	4	+1
0022	39/58	5H	65.1 +	5.5 -	1095 +2	4	+1
*0023	39/60	6H	62.6	6.4	1030	2	+1
*0024	39/61	7H	62.0	8.6	940	4	+1
0025	39/65						
0026	39/66						
0027	39/75						
0028	39/78	4H	61.9	4.4 -2	940	4	+1
0029	39/79	6H	63.0	5.5 -	930	5	+1
0030	39/84	4H	62.1	3.8 -	970 -	4	+1
0031	39/87	6H	65.6 +	6.3 -	975	4	+1
0032	39/89	5H	63.4	5.5 -	970	3	+1
0033	39/92	4H	62.1	4.4 -2	955	4	+1
0034	39/93	5H	64.1	5.2 -2	955	4	+1
0035	39/97	4H	60.6	4.1 -	940 -2	3	+1
0036	39/99	4H	61.2	4.4 -	975 -	4	+1
0037	39/100	5H	63.0	5.2 -2	985	4	+1
0038	39/104	5H	63.5	5.9 -	1065 +2	4	+1
0039	39/105	5H	63.1	5.7 -	970	5	+1
0040	39/107	6H	62.2	6.5 -	965	5	+1

* = standard mean nursery flour protein = 11.8 mill used = Quad

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UMHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0041	[(MENOX8156)x((TOBXFN)x8B))xKLASIC]xSGY	39/108	HRS	62.6	82	12.8	66.3	30.1	0.30	86.0	11.8	60.9
0042	[(MENOX8156)x((TOBXFN)x8B))xKLASIC]xKLA	39/111	HWS	62.1	64	13.1	66.5		0.28 +	87.2	11.5	59.5
0043	[(MENOX8156)x((TOBXFN)x8B))xKLASIC]xKLA	39/112	HWS	62.8	62	12.4	68.0 +	32.5	0.31	87.2	11.2	59.7
0044	[(MENOX8156)x((TOBXFN)x8B))xKLASIC]xKLA	39/113	HWS	62.9	66	13.3	65.7	31.7	0.29 +	85.9	11.6	60.0
0045	[(MENOX8156)x((TOBXFN)x8B))xKLASIC]xKLA	39/114	HWS	63.7	63	13.1	67.8 +	33.0	0.39 -2	82.8 -	11.9	58.9
0046	[(MENOX8156)x((TOBXFN)x8B))xKLASIC]xKLA	39/118	HWS	63.6	65	12.8	67.2	31.1	0.30	86.9	11.0	58.8
0047	[(MENOX8156)x((TOBXFN)x8B))xKLASIC]xKLA	39/121	HWS	63.9	66	13.4	66.2	30.8	0.28 +	86.9	11.8	59.8
0048	[(MENOX8156)x((TOBXFN)x8B))xKLASIC]xKLA	39/123	HWS	63.1	61	13.6	67.7 +	33.2	0.27 +2	89.0 +	11.7	60.3
0049	[(MENOX8156)x((TOBXFN)x8B))xKLASIC]xKLA	39/124	HWS	64.0	68	12.5	68.1 +	31.1	0.29 +	88.4 +	11.3	59.9
0050	[(MENOX8156)x((TOBXFN)x8B))xKLASIC]xKLA	39/125	HWS	62.3	56	13.6	66.2	32.4	0.32	84.8	11.9	61.8
0051	[(MENOX8156)x((TOBXFN)x8B))xKLASIC]xKLA	39/127	HWS	62.9	52	13.2	66.9	31.5	0.30	86.6	11.4	60.8
0052	[(MENOX8156)x((TOBXFN)x8B))xKLASIC]xKLA	39/131	HWS	62.7	72	13.1	65.9	31.2	0.30	85.5	11.5	61.8
0053	[(MENOX8156)x((TOBXFN)x8B))xKLASIC]xKLA	39/133	HWS	63.7	60	13.9	68.1 +	33.1	0.32	86.8	12.0	60.9
0054	[(MENOX8156)x((TOBXFN)x8B))xKLASIC]xKLA	39/137	HWS	63.6	61	13.7	68.7 +2	32.4	0.32	87.4 +	11.9	62.3
0055	[(MENOX8156)x((TOBXFN)x8B))xKLASIC]xKLA	39/138	HWS	63.0	64	13.4	66.7	30.9	0.32	85.3	11.7	60.9
0056	[(MENOX8156)x((TOBXFN)x8B))xKLASIC]xKLA	39/139	HWS	64.0	74	13.4	69.4 +2	32.9	0.31	88.7 +	11.9	61.6
0057	[(MENOX8156)x((TOBXFN)x8B))xKLASIC]xKLA	39/140	HWS	62.3	63	13.2	66.6	31.2	0.27 +2	87.8 +	11.5	60.0
0058	[(ZAGREB 673/2xINIA 66)xKLASIC]x[(ANZAXT	39/142	HRS	63.7 +	72	13.2	64.0 -2	27.3	0.27 +2	85.1	11.3	61.0
0059	[(ZAGREB 673/2xINIA 66)xKLASIC]x[(ANZAXT	39/144	HRS	62.4	71	13.6	63.5 -2	25.9	0.30	83.0 -	11.9	
0060	[(ZAGREB 673/2xINIA 66)xKLASIC]x[(ANZAXT	39/146	HRS	62.7	58	13.1	67.4	32.0	0.30	87.1	11.8	61.7
0061	[(ZAGREB 673/2xINIA 66)xKLASIC]x[(ANZAXT	39/148	HWS	63.5	61	13.8	65.0 -	30.6	0.28 +	85.6	11.8	61.9
0062	[(ZAGREB 673/2xINIA 66)xKLASIC]x[(ANZAXT	39/152	HWS	61.6	53	13.6	66.1	32.8	0.28 +	86.8	12.0	61.5
0063	[(ZAGREB 673/2xINIA 66)xKLASIC]x[(ANZAXT	39/153	HRS	62.1	68	12.6	65.2 -	28.6	0.29 +	85.3	11.1	60.1
0064	[(ZAGREB 673/2xINIA 66)xKLASIC]x[(ANZAXT	39/156	HWS	63.2	60	13.8	64.8 -	30.3	0.29 +	84.9	12.4	63.0 +
0065	[(ZAGREB 673/2xINIA 66)xKLASIC]x[(ANZAXT	39/163	HRS	62.6	60	13.7	66.2	31.7	0.29 +	86.4	12.5 +	62.4 +
0066	[(ZAGREB 673/2xINIA 66)xKLASIC]x[(ANZAXT	39/166	HWS	62.4	57	14.9 +	66.5	33.5	0.31	85.6	12.7	60.8
0067	[(KLEIN SENDEROXANZA)xKLASIC]x[(NDF TP2	39/188	HWS	63.3	59	13.5	66.3	31.6	0.30	86.0	11.9	61.9
0068	[(KLEIN SENDEROXANZA)xKLASIC]x[(NDF TP2	39/190	HRS	62.5	77	14.6 +	65.1 -	25.7	0.36 -2	81.6 -	12.8 +	62.0 +
0069	YOLO	39/246	HRS	61.3	78	13.5	63.9 -2	25.8	0.37 -2	79.8 -2	11.9	61.2
0070	[(C113232xR50)xANZAUC360]xYECORA ROJO	39/250	HRS	60.1 -	71	14.8 +	62.4 -2	23.8	0.37 -2	78.2 -2	12.9 +	
0071	[(C113232xR50)xANZAUC360]xYECORA ROJO	39/255	HRS	61.9	85	13.0	64.6 -	25.9	0.36 -2	81.1 -2	11.5	59.8
0072	[(C113232xR50)xANZAUC360]xYECORA ROJO	39/256	HRS	61.5	76	14.3 +	63.0 -2	27.4	0.35 -	79.9 -2	12.7 +	
0073	[(C113232xR50)xANZAUC360]xYECORA ROJO	39/257	HRS	62.0	61	13.6	66.2	33.2	0.26 +2	87.9 +	11.9	60.0
0074	[(C113232xR50)xANZAUC360]xYECORA ROJO	39/269	HRS	62.5	75	13.2	64.8 -	25.6	0.37 -2	80.7 -2	11.4	58.9
0075	[(C113232xR50)xANZAUC360]xYECORA ROJO	39/270	HWS	62.1	58	14.1	66.7	27.8	0.36 -2	83.2	12.6	60.8
0076	[(C113232xR50)xANZAUR355]xSGY022	39/283	HWS	61.7	67	12.9	64.4 -	30.6	0.34 -	81.9 -	11.4	57.4
0077	(ANZAXJUSTINUC453)xPROBRAND 771	39/303	HRS	62.2	67	14.0	66.4	31.9	0.31	85.5	12.8 +	63.0 +
0078	(ANZAXJUSTINUC453)xKLASIC	39/334	HRS	62.4	62	12.9	68.9 +2	32.6	0.32	87.6	11.5	58.9
0079	(ANZAXJUSTINUC453)xKLASIC	39/335	HRS	61.7	90	14.7 +	63.8 -2	27.4	0.33	81.8 -	12.8 +	
0080	(ANZAXJUSTINUC453)xSGY022	39/337	HRS	62.3	75	13.5	63.8 -2	28.8	0.32	82.3 -	12.1	

* = standard mean nursery flour protein = 11.8 mill used = Quad

SAMPLE#	BREEDER#	MTYPE	BABS	MTIME	LVOL	BCRGR	PROQ
0041	39/108	5H	63.1	4.9 -2	995 +	3	+1
0042	39/111	6H	61.7	6.8	965 -	5	+1
0043	39/112	5H	61.9	7.2	980 -	4	+1
0044	39/113	5H	62.2	4.9	1005	3	+1
0045	39/114	4H	61.1	4.6 -	1080 +	4	+1
0046	39/118	5H	61.0	6.3	1040	5	+1
0047	39/121	5H	62.0	5.2	1055	4	+1
0048	39/123	5H	62.5	4.9	1075 +	3	+1
0049	39/124	7H	62.1	8.9 +2	1015	4	+1
0050	39/125	6H	64.0	7.1	1090 +	3	+1
0051	39/127	6H	63.0	7.3	1075 +	3	+1
0052	39/131	7H	64.0	7.3	985 -	5	+1
0053	39/133	4H	63.1	4.7 -	1030	3	+1
0054	39/137	6H	64.5	6.7	1055	4	+1
0055	39/138	5H	63.1	5.2	1050	4	+1
0056	39/139	5H	63.8	4.3 -	985 -	4	+1
0057	39/140	6H	62.2	7.3	980 -	3	+1
0058	39/142	5H	63.7	4.4 -2	955	4	+1
0059	39/144						
0060	39/146	4H	63.9	5.8 -	1050 +2	4	+1
0061	39/148	5H	65.1	5.1	1030	4	+1
0062	39/152	4H	63.7	4.4 -	1075 +	4	+1
0063	39/153	5H	62.3	5.2 -2	980	4	+1
0064	39/156	6H	65.2 +	6.8	1040	3	+1
0065	39/163	4H	64.6 +	4.1 -2	1085 +2	3	+1
0066	39/166	5H	64.0	5.3	1050	4	+1
0067	39/188	5H	65.1	4.9	940 -2	5	+1
0068	39/190	5H	66.2 +	5.3 -2	1100 +2	4	+1
0069	39/246	6H	64.4	6.8	1030 +2	5	+1
0070	39/250						
0071	39/255	6H	63.0	7.7	1025 +	4	+1
0072	39/256						
0073	39/257	4H	63.2	5.2 -2	1115 +2	2	+1
0074	39/269	6H	63.1	5.5 -	965	5	+1
0075	39/270	4H	64.0	4.1 -	1045	4	+1
0076	39/283	4H	60.6	4.6 -	1120 +2	2	+1
0077	39/303	4H	64.2	3.4 -2	1075 +2	3	+1
0078	39/334	4H	61.1	4.1 -2	990 +	3	+1
0079	39/335						
0080	39/337						

* = standard mean nursery flour protein = 11.8 mill used = Quad

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0081	(ANZAXJUSTINUC453)xSGY022	39/341	HRS	62.2	85	14.8 +	61.9 -2	24.9	0.33	79.8 -2	12.9 +	
*0082	KLASIC	39/349	HWS	61.5	67	13.0	66.4	30.6	0.34	84.0	11.9	59.7
0083	(CHRIS MUTxANZA)xYECORA ROJO	39/363	HWS	62.5	76	13.5	65.0 -	28.3	0.38 -2	80.4 -2	11.5	59.1
0084	(CHRIS MUTxANZA)xYECORA ROJO	39/365	HRS	62.2	61	14.5 +	62.3 -2	25.4	0.35 -	79.2 -2	11.9	
0085	(TX 71C 8130RANZA)xYECORA ROJO	39/375	HRS	61.2	53	13.8	65.9	30.9	0.33	84.0	12.1	60.2
0086	(TX 71C 8130RANZA)xYECORA ROJO	39/376	HWS	62.0	57	14.6 +	64.4 -	30.7	0.33	82.4 -	12.9	63.9 +
0087	(TX 71C 8130RANZA)xYECORA ROJO	39/384	HRS	61.6	59	15.9 +2	66.0	29.4	0.36 -2	82.5 -	13.2 +	60.9
0088	(TX 75U 1189XTOLO)xKLASIC	39/408	HWS	61.5	58	15.2 +	63.6 -2	25.6	0.36 -2	80.0 -2	12.5	
0089	(TX 75U1189XANZA)xSGY022	39/420	HRS	62.1	59	14.5 +	63.9 -2	24.6	0.35 -	80.8 -2	12.3	
0090	(TX 75U1189XANZA)xSGY022	39/421	HRS	62.1	66	13.4	65.1 -	25.1	0.37 -2	81.1 -2	12.0	61.5
0091	(TADORNAXINIA 66)xYECORA ROJO	39/485	HRS	62.3	78	14.9 +	61.1 -2	23.3	0.31	80.0 -2	12.1	
0092	I(NUDIF TP250XINIA 66)xANZAJxYECORA ROJO	39/501	HRS	60.3	66	14.7 +	64.6 -	26.9	0.34 -	82.1 -	12.5 +	63.7 +
0093	PIMAUC490xYECORA ROJO	39/514	HRS	61.4	57	14.4 +	63.5 -2	24.2	0.34 -	80.9 -2	12.1	
0094	PIMAUC490xYECORA ROJO	39/523	HRS	62.6	79	13.7	62.8 -2	25.6	0.33	80.7 -2	11.6	
0095	I((BC60XC11232)xINIA 66)xANZAUC497)xYEC	39/559	HRS	124. +2	63	14.1	66.4	30.4	0.33	84.5	12.1	59.9
0096	I(NUDIF TP250XINIA 66)xANZAUC547)xYECORA	39/572	HRS	63.1	77	14.5 +	62.7 -2	23.7	0.35 -	79.6 -2	12.0	
0097	ANZAXYECORA ROJO	39/576	HRS	61.9	87	13.8	64.6 -	27.4	0.33	82.6 -	12.4 +	62.9 +
0098	ANZAXYECORA ROJO	39/580	HRS	62.1	81	14.1	66.5	29.1	0.33	84.6	12.8 +	63.8 +
0099	(YECORA 76xANZA)xYECORA ROJO	39/606	HRS	61.9	82	14.9 +	62.5 -2	25.4	0.29 +	82.5 -	12.6 +	
0100	I((INIAxCHO)xCAL)xANZAJxPROBRAND 771	39/615	HRS	59.9 -	77	13.5	62.8 -2	26.0	0.36 -2	79.2 -2	11.8	
0101	I((INIAxCHO)xCAL)xANZAJxYECORA ROJO	39/625	HRS	60.1 -	63	14.4 +	65.2 -	29.9	0.33	83.2 -	12.7 +	60.9
0102	(JILGUERO'S'xANZA)xYECORA ROJO	39/644	HRS	62.9	78	14.0	65.7	26.3	0.33	83.8	12.0	62.0 +
0103	(TZPPx2*ANZA)xYECORA ROJO	39/655	HRS	60.6	84	14.4 +	64.4 -	25.6	0.36 -2	80.8 -2	12.8 +	64.4 +
0104	(TZPPx2*ANZA)xTZPP	39/667	HRS	62.0	73	14.2	62.0 -2	24.8	0.36 -2	78.3 -2	12.5 +	
0105	(TZPPx2*ANZA)xYECORA ROJO	39/675	HRS	62.6	69	14.8 +	63.9 -2	28.6	0.32	82.4 -	12.7 +	
0106	(TZPPx2*ANZA)xPROBRAND 771	39/686	HWS	63.6	68	14.9 +	65.7	30.3	0.28 +	86.4	12.6	61.7
0107	(TZPPx2*ANZA)xPROBRAND 771	39/692	HRS	63.0	79	14.7 +	61.0 -2	25.5	0.32	79.4 -2	12.5 +	
0108	(TZPPx2*ANZA)xPROBRAND 771	39/696	HRS	62.7	79	14.8 +	64.8 -	29.6	0.30	84.4	13.0 +	60.8
0109	(TZPPx2*ANZA)xPROBRAND 771	39/697	HRS	63.2	75	15.1 +	62.0 -2	26.3	0.33	79.9 -2	12.9 +	
0110	(TZPPx2*ANZA)xYECORA ROJO	39/704	HRS	62.7	81	13.8	61.7 -2	22.7	0.34 -	79.1 -2	11.5	
0111	(TZPPx2*ANZA)xSGY022	39/706	HWS	63.6	72	13.5	64.1 -2	25.1	0.38 -2	79.5 -2	11.5	59.9
0112	(TZPPx2*ANZA)xYECORA ROJO	39/707	HRS	62.7	75	15.1 +	63.7 -2	28.1	0.32	82.2 -	13.1 +	
0113	(TZPPx2*ANZA)xYECORA ROJO	39/708	HRS	63.8 +	61	15.7 +	63.5 -2	28.0	0.30	83.0 -	13.2 +	
0114	(TZPPx2*ANZA)xYECORA ROJO	39/709	HRS	63.6	77	14.7 +	62.7 -2	26.8	0.35 -	79.6 -2	12.5 +	
0115	(TZPPx2*ANZA)xYECORA ROJO	39/710	HRS	63.4	67	14.6 +	66.0	29.0	0.32	84.6	12.8 +	60.9
0116	(TZPPx2*ANZA)xYECORA ROJO	39/713	HRS	62.5	62	14.8 +	64.3 -	27.6	0.31	83.3 -	12.6 +	62.3 +
0117	(TZPPx2*ANZA)xYECORA ROJO	39/715	HRS	63.1	65	14.7 +	61.4 -2	25.9	0.31	80.3 -2	12.3	
0118	(TZPPx2*ANZA)xYECORA ROJO	39/717	HRS	63.2	67	15.2 +	64.2 -2	27.8	0.30	83.8	12.8 +	60.5
0119	(TZPPx2*ANZA)xYECORA ROJO	39/718	HRS	62.4	72	14.8 +	61.7 -2	25.5	0.36 -2	78.0 -2	12.2	
0120	(TZPPx2*ANZA)xSGY022	39/725	HWS	61.1	82	13.3	63.9 -2	27.4	0.36 -2	80.3 -2	11.8	

* = standard mean nursery flour protein = 11.8 mill used = Quad

SAMPLE#	BREEDER#	MTYPE	BABS	MTIME	LVOL	BCRGR	PROQ
0081	39/341						
*0082	39/349	6H	62.9	6.8	1050	4	+1
0083	39/363	3H	63.3	3.4 -2	985 -	5	+1
0084	39/365						
0085	39/375	5H	65.4 +	5.2 -2	1065 +2	3	+1
0086	39/376						
0087	39/384	5H	67.6 +2	6.8	1125 +2	3	+1
0088	39/408	6H	64.1	6.9	1040 +2	4	+1
0089	39/420						
0090	39/421	5H	64.7 +	5.5 -	1025 +	4	+1
0091	39/485						
0092	39/501						
0093	39/514	8H	65.9 +	11.5 +2	890 -	7	-1
0094	39/523						
0095	39/559	4H	63.9	4.9 -2	1045 +2	2	+1
0096	39/572						
0097	39/576	5H	65.1 +	5.5 -	1020 +	2	+1
0098	39/580	5H	65.0 +	9.1	1030 +2	4	+1
0099	39/606						
0100	39/615						
0101	39/625						
0102	39/644	4H	63.1	4.4 -2	1230 +2	3	+1
0103	39/655	4H	64.2	4.0 -2	995 +	5	+1
0104	39/667	5H	69.6 +2	5.7 -	1120 +2	2	+1
0105	39/675						
0106	39/686						
0107	39/692	3H	64.9	3.0 -2	945 -2	3	0
0108	39/696						
0109	39/697	4H	64.0	4.5 -2	1030 +2	4	+1
0110	39/704						
0111	39/706						
0112	39/707	5H	64.1	5.4	945 -2	5	+1
0113	39/708						
0114	39/709						
0115	39/710	4H	65.1 +	4.3 -2	1060 +2	3	+1
0116	39/713						
0117	39/715	4H	65.5 +	3.5 -2	1030 +2	5	+1
0118	39/717						
0119	39/718	3H	64.7 +	3.4 -2	1090 +2	3	+1
0120	39/725						

* = standard mean nursery flour protein = 11.8 mill used = Quad

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0121	(TZPPx2*ANZA)xSGY022	39/729	HWS	62.5	76	15.1 +	62.8 -2	26.1	0.35 -	79.7 -2	12.8	
0122	(TZPPx2*ANZA)xYECORA ROJO	39/732	HRS	62.0	76	14.2	63.7 -2	28.2	0.32	82.2 -	12.2	
0123	YECORA ROJO	39/735	HRS	61.4	72	14.0	63.3 -2	26.1	0.35 -	80.2 -2	12.2	62.7 +
0124	YOLO	39/736	HRS	61.0	67	13.6	66.3	26.9	0.32	84.9	11.6	59.8
0125	(TZPPx2*ANZA)xYECORA ROJO	39/737	HWS	62.5	73	13.7	64.1 -2	26.0	0.33	82.1 -	11.6	60.9
0126	(TZPPx2*ANZA)xYECORA ROJO	39/739	HRS	61.9	70	13.6	61.8 -2	25.1	0.35 -	78.6 -2	11.9	
0127	(TZPPx2*ANZA)xYECORA ROJO	39/741	HRS	62.6	69	14.3 +	62.6 -2	26.8	0.31	81.6 -	12.2	
0128	(TZPPx2*ANZA)xSGY022	39/744	HWS	63.8	59	14.8 +	63.1 -2	26.6	0.30	82.6 -	11.9	
0129	(TZPPx2*ANZA)xSGY022	39/745	HRS	64.5 +	74	13.7	65.0 -	26.7	0.34 -	82.5 -	11.7	60.0
0130	VEERY'S1 YECORA ROJO	39/751	HRS	63.1	74	12.8	64.6 -	25.6	0.30	84.2	11.2	59.9
0131	SGY022xYECORA ROJO	39/752	HRS	63.4	73	12.7	68.2 +	30.0	0.32	86.9	11.3	60.8
0132	SGY022xYECORA ROJO	39/753	HRS	63.3	81	13.6	64.1 -2	26.3	0.34 -	81.6 -	11.8	60.8
0133	SGY022xYECORA ROJO	39/754	HRS	62.9	92	14.0	62.7 -2	24.6	0.34 -	80.1 -2	12.3	
0134	SGY022xYECORA ROJO	39/755	HRS	63.7 +	63	13.3	65.9	29.9	0.32	84.5	11.8	61.9
0135	SGY022xYECORA ROJO	39/758	HRS	64.2 +	60	13.0	67.7 +	29.3	0.32	86.4	11.3	62.0 +
0136	[[SONORA 64xR50)xINIA 66]xYECORA ROJO	39/760	HRS	62.0	78	12.7	67.1	30.5	0.32	85.8	11.4	61.9
0137	[[SONORA 64xR50)xINIA 66]xYECORA ROJO	39/764	HRS	62.9	73	14.2	62.6 -2	20.4	0.34 -	80.0 -2	12.3	
0138	[[SONORA 64xR50)xINIA 66]xYECORA ROJO	39/766	HRS	62.7	61	13.7	64.9 -	27.1	0.28 +	85.5	11.7	60.9
0139	[[SONORA 64xR50)xINIA 66]xPROBRAND 771	39/768	HRS	62.1	66	13.9	63.5 -2	25.3	0.33	81.5 -	11.7	
0140	[[SONORA 64xR50)xINIA 66]xPROBRAND 771	39/770	HWS	62.1	66	13.4	64.5 -	25.1	0.36 -2	80.9 -2	11.2	60.5
0141	[[SONORA 64xR50)xINIA 66]xPROBRAND 771	39/771	HWS	62.3	71	13.4	64.7 -	26.0	0.37 -2	80.6 -2	11.6	60.9
0142	[[SONORA 64xR50)xINIA 66]xPROBRAND 771	39/772	HRS	62.1	63	14.1	64.0 -2	25.6	0.35 -	80.9 -2	11.7	59.8
0143	[[SONORA 64xR50)xINIA 66]xPROBRAND 771	39/773	HRS	62.2	47	14.3 +	64.2 -2	25.4	0.35 -	81.2 -2	11.3	59.8
*0144	KLASIC	39/774	HWS	62.9	56	13.0	66.8	30.1	0.30	86.5	11.5	59.7
*0145	SERRA	39/775	HRS	62.2	48	12.9	66.9	31.7	0.31	86.1	10.8	59.0
0146	[[SONORA 64xR50)xINIA 66]xPROBRAND 771	39/778	HRS	62.1	63	14.2	64.0 -2	25.4	0.33	82.0 -	11.8	60.1
0147	[[SONORA 64xR50)xINIA 66]xPROBRAND 771	39/783	HWS	60.9	68	13.2	62.9 -2	25.4	0.36 -2	79.3 -2	11.4	
0148	[[SONORA 64xR50)xINIA 66]xPROBRAND 771	39/784	HRS	62.4	74	13.2	63.0 -2	24.4	0.34 -	80.4 -2	11.5	
0149	[[SONORA 64xR50)xINIA 66]xPROBRAND 771	39/785	HWS	62.1	78	13.0	63.8 -2	26.2	0.34 -	81.3 -	11.6	
0150	[[SONORA 64xR50)xINIA 66]xPROBRAND 771	39/786	HWS	61.9	70	13.3	62.6 -2	24.8	0.34 -	80.0 -2	11.6	
0151	[[SONORA 64xR50)xINIA 66]xPROBRAND 771	39/788	HWS	61.8	64	14.0	64.2 -	26.5	0.34 -	81.7 -	11.8	60.1
0152	[[SONORA 64xR50)xINIA 66]xPROBRAND 771	39/789	HWS	62.1	65	13.5	63.6 -2	22.0	0.34 -	81.1 -	11.4	
0153	[[SONORA 64xR50)xINIA 66]xPROBRAND 771	39/791	HWS	61.6	70	13.3	64.3 -	26.1	0.36 -2	80.7 -2	11.5	60.0
0154	[[SONORA 64xR50)xINIA 66]xPROBRAND 771	39/792	HWS	61.6	68	13.6	63.8 -2	25.8	0.35 -	80.7 -2	11.6	
0155	[[SONORA 64xR50)xINIA 66]xPROBRAND 771	39/793	HWS	62.2	73	13.1	63.7 -2	25.8	0.35 -	80.6 -2	11.4	
0156	[[SONORA 64xR50)xINIA 66]xPROBRAND 771	39/794	SWS	61.5	49	14.2	65.3	27.1	0.37 -2	80.7 -2	11.4	59.3
0157	[[SONORA 64xR50)xINIA 66]xPROBRAND 771	39/795	HWS	61.5	81	13.6	63.0 -2	25.4	0.37 -2	78.9 -2	11.6	
0158	[[SONORA 64xR50)xINIA 66]xPROBRAND 771	39/796	HWS	61.7	77	13.9	63.2 -2	25.2	0.36 -2	79.6 -2	11.9	
0159	YECORA ROJO	39/797	HRS	62.2	73	14.1	64.8 -	25.8	0.36 -2	81.3 -	12.1	61.5
0160	[[SONORA 64xR50)xINIA 66]xPROBRAND 771	39/798	HRS	62.3	83	13.4	66.1	26.1	0.34 -	83.7	11.8	60.7

* = standard mean nursery flour protein = 11.8 mill used = Quad

SAMPLE#	BREEDER#	MTYPE	BABS	MTIME	LVOL	BCRGR	PROQ
0121	39/729						
0122	39/732						
0123	39/735	6H	66.9 +2	6.7 -	1015 +	4	+1
0124	39/736	2H	63.0	2.1 -2	1050 +2	4	+1
0125	39/737	5H	65.1	4.7 -	930 -2	4	+1
0126	39/739						
0127	39/741						
0128	39/744						
0129	39/745	5H	65.2 +	4.5 -2	1000 +	4	+1
0130	39/751	4H	65.1 +	3.4 -2	1050 +2	2	+1
0131	39/752	6H	64.0	7.8	930	4	+1
0132	39/753	3H	64.0	4.1 -2	1075 +2	3	+1
0133	39/754						
0134	39/755	3H	64.1	4.1 -2	1075 +2	2	+1
0135	39/758	7H	65.2 +	11.0 +2	1000 +	3	+1
0136	39/760						
0137	39/764	3H	65.6 +	5.6 -	1000 +	4	+1
0138	39/766	5H	64.6 +	5.4 -	890 -	5	0
0139	39/768						
0140	39/770	5H	64.2	5.5	950 -	4	+1
0141	39/771						
0142	39/772	6H	64.1	7.6 +	985 -	5	+1
0143	39/773	5H	64.0	6.2 -	950	4	+1
*0144	39/774	5H	64.0	5.3 -2	945	3	+1
*0145	39/775	5H	63.9	6.1	1035	3	+1
		6H	63.2	7.3	900	6	+1
0146	39/778						
0147	39/783	5H	64.3	5.4 -	1065 +2	4	+1
0148	39/784						
0149	39/785						
0150	39/786						
0151	39/788						
0152	39/789	5H	64.8	5.5	1000	3	+1
0153	39/791	5H	64.2	6.1	995	3	+1
0154	39/792						
0155	39/793						
0156	39/794						
0157	39/795	5H	63.5	6.8	990	4	+1
0158	39/796						
0159	39/797	5H	66.2 +	5.7 -	1000 +	3	+1
0160	39/798	6H	65.9 +	6.1 -	945	5	+1

* = standard mean nursery flour protein = 11.8 mill used = Quad

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UMHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0161	[(SONORA 64XR50)xINIA 66]xPROBRAND 771	39/801	HRS	62.2	63	13.3	64.2 -2	25.6	0.35 -	81.2 -2	11.1	60.0
0162	[(SONORA 64XR50)xINIA 66]xSGY022	39/803	HWS	62.8	80	13.1	63.9 -2	27.0	0.33	81.9 -	11.6	
0163	[(SONORA 64XR50)xINIA 66]xSGY022	39/807	HWS	62.5	64	15.2 +	61.4 -2	26.5	0.33	79.3 -2	12.2	
0164	[(SONORA 64XR50)xINIA 66]xSGY022	39/809	HWS	63.1	84	13.3	63.5 -2	27.2	0.31	82.5 -	11.5	
0165	[(SONORA 64XR50)xINIA 66]xSGY022	39/810	HWS	62.6	70	13.6	63.7 -2	27.7	0.31	82.7 -	11.6	
0166	[(SONORA 64XR50)xINIA 66]xSGY022	39/811	HWS	62.3	75	13.6	64.7 -	27.7	0.31	83.8	12.0	61.6
0167	[(SONORA 64XR50)xINIA 66]xSGY022	39/813	HWS	62.6	85	12.4	62.0 -2	25.4	0.34 -	79.4 -2	10.8	
0168	[(SONORA 64XR50)xINIA 66]xSGY022	39/815	HWS	62.5	81	14.0	61.8 -2	26.2	0.32	80.2 -2	12.1	
0169	[(SONORA 64XR50)xINIA 66]xSGY022	39/818	HWS	62.3	86	13.1	64.3 -	27.1	0.31	83.3	11.8	61.8
0170	[(SONORA 64XR50)xINIA 66]xSGY022	39/820	HWS	63.5	75	13.8	64.1 -2	27.2	0.32	82.6 -	11.7	61.2
0171	[(SONORA 64XR50)xINIA 66]xSGY022	39/825	HWS	62.3	81	13.0	63.7 -2	27.2	0.32	82.2 -	11.6	
0172	(SONORA 64XR50)xINIA 66]xSGY022	39/826	HRS	62.4	79	14.5 +	61.8 -2	25.1	0.30	81.3 -	11.6	
0173	(NURI 70xANZA)xPROBRAND 771	39/833	HWS	61.8	80	14.4	65.5	27.6	0.34 -	83.0 -	12.2	61.6
0174	[(TOB 66xCNO)xANZA]xYECORA ROJO	39/839	HRS	62.9	59	14.1	67.1	31.5	0.28 +	87.8 +	11.9	59.9
0175	[(INIAxCNO)xCAL]xANZA]xPROBRAND 771	39/845	HRS	63.9 +	76	13.5	66.3	27.2	0.30	86.0	11.9	63.0 +
0176	[(INIAxCNO)xCAL]xANZA]xPROBRAND 771	39/849	HRS	62.7	82	14.2	62.7 -2	24.8	0.32	81.2 -2	12.1	
0177	[(INIAxCNO)xCAL]xANZA]xYECORA ROJO	39/857	SRS	62.5	48	13.2	66.2	32.6	0.35 -	83.1 -	11.1	60.7
0178	[(INIAxCNO)xCAL]xANZA]xSGY022	39/861	HRS	65.0 +	82	13.1	64.2 -2	24.9	0.30	83.8	11.1	59.1
0179	(ANZASARIC 70)xYECORA ROJO	39/868	HRS	64.3 +	87	12.2	65.1 -	28.6	0.33	83.1 -	10.9	60.2
0180	(ANZASARIC 70)xKLASIC	39/876	HWS	64.0	78	13.1	65.9	30.1	0.31	85.0	11.3	61.1
0181	(ANZASARIC 70)xSGY022	39/881	HWS	62.8	53	13.1	65.1 -	29.8	0.30	84.7	11.1	60.2
0182	[(MENOX8156)x((TOBxFN)xBB)]xYECORA ROJO	39/889	HRS	64.2 +	56	14.2	64.2 -2	27.6	0.29 +	84.3	11.8	60.2
0183	[(MENOX8156)x((TOBxFN)xBB)]xYECORA ROJO	39/897	HRS	63.5	73	14.1	63.6 -2	26.9	0.29 +	83.7	12.1	
0184	[(MENOX8156)x((TOBxFN)xBB)]xYECORA ROJO	39/898	HWS	63.8	58	13.7	66.7	32.7	0.29 +	86.9	11.7	61.5
0185	[(MENOX8156)x((TOBxFN)xBB)]xSGY022	39/899	HRS	63.5	66	14.8 +	64.2 -2	28.0	0.30	83.8	12.0	60.4
0186	[(MENOX8156)x((TOBxFN)xBB)]xSGY022	39/911	HRS	62.8	75	13.5	63.9 -2	28.7	0.33	81.9 -	11.4	
0187	[(MENOX8156)x((TOBxFN)xBB)]xSGY022	39/913	HRS	63.3	74	13.5	64.9 -	26.5	0.34 -	82.4 -	11.7	67.5 +2
0188	(ZAGREB 673/2xINIA 66)xYECORA ROJO	39/919	HWS	63.1	54	13.0	68.3 +	33.3	0.29 +	88.6 +	11.3	58.5
0189	(ZAGREB 673/2xINIA 66)xYECORA ROJO	39/921	HWS	63.1	61	12.7	67.0	33.2	0.29 +	87.2	11.4	59.1
0190	(ZAGREB 673/2xINIA 66)xYECORA ROJO	39/922	HRS	62.6	55	12.7	64.6 -	29.6	0.29 +	84.7	11.3	58.4
0191	(ZAGREB 673/2xINIA 66)xYECORA ROJO	39/923	HWS	62.5	52	12.7	65.7	25.2	0.30	85.3	11.0	58.0
0192	(ZAGREB 673/2xINIA 66)xYECORA ROJO	39/925	HRS	62.5	54	13.1	65.9	31.4	0.30	85.5	11.5	58.0
0193	(ZAGREB 673/2xINIA 66)xYECORA ROJO	39/930	SWS	62.0	46	13.3	69.1 +2	34.4	0.33	88.1 +	11.2	57.3
0194	(ZAGREB 673/2xINIA 66)xYECORA ROJO	39/936	SWS	62.6	34	13.3	68.5 +	33.4	0.31	88.6 +	10.9	57.1 -
0195	(ZAGREB 673/2xINIA 66)xYECORA ROJO	39/940	HWS	63.4	61	13.2	66.5	30.4	0.27 +2	87.7 +	11.8	60.0
0196	(ZAGREB 673/2xINIA 66)xKLASIC	39/956	HRS	62.3	67	13.9	62.9 -2	26.7	0.31	81.9 -	11.6	
0197	(ZAGREB 673/2xINIA 66)xKLASIC	39/957	HRS	62.7	54	13.8	63.7 -2	30.0	0.31	82.7 -	11.7	
0198	(ZAGREB 673/2xINIA 66)xKLASIC	39/959	HRS	62.2	63	13.3	62.9 -2	25.4	0.32	81.4 -	10.7	
*0199	KLASIC	39/974	HWS	62.5	52	12.9	65.7	28.3	0.31	84.8	11.4	59.8
*0200	SERRA	39/975	HRS	61.7	55	12.5	65.9	32.2	0.32	84.5	10.9	58.9

* = standard mean nursery flour protein = 11.8 mill used = Quad

SAMPLE#	BREEDER#	MTYPE	BABS	MTIME	LVOL	BCGR	PROQ
0161	39/801	5H	65.2 +	5.2 -2	965	5	+1
0162	39/803						
0163	39/807						
0164	39/809						
0165	39/810						
0166	39/811	5H	65.8 +	4.9	1005	3	+1
0167	39/813						
0168	39/815						
0169	39/818	6H	66.0 +	6.8	1035	3	+1
0170	39/820	5H	63.4	5.8	1000	4	+1
0171	39/825						
0172	39/826						
0173	39/833	5H	62.8	4.0 -	990	3	+1
0174	39/839	5H	62.1	4.5 -2	1005 +	2	+1
0175	39/845	5H	65.2 +	5.7 -	1050 +2	3	+1
0176	39/849						
0177	39/857	5H	62.9	5.1 -2	1000 +	5	+1
0178	39/861	5H	62.3	4.5 -2	875 -	5	0
0179	39/868	4H	63.4	4.5 -2	890 -	4	+1
0180	39/876	3H	63.3	3.4 -2	935 -2	4	+1
0181	39/881	5H	62.4	5.9	935 -2	3	+1
0182	39/889	4H	62.4	3.9 -2	1010 +	4	+1
0183	39/897						
0184	39/898	6H	63.7	6.2	1030	4	+1
0185	39/899	3H	62.6	3.6 -2	965	5	+1
0186	39/911						
0187	39/913	7H	68.7 +2	9.6 +	945	4	+1
0188	39/919	5H	60.7	5.0	1000	4	+1
0189	39/921	4H	61.3	5.3	945 -2	3	+1
0190	39/922	6H	60.6	6.2 -	1015 +	5	+1
0191	39/923	6H	61.7	6.6	970 -	4	+1
0192	39/925	5H	61.2	5.5 -	1025 +	5	+1
0193	39/930	5H	60.5 -	5.1	1085 +	5	+1
0194	39/936	5H	59.3 -	4.4 -	1000	5	+1
0195	39/940	5H	62.2	4.8 -	1025	4	+1
0196	39/956						
0197	39/957						
0198	39/959						
*0199	39/974	5H	62.0	5.5	1005	2	+1
*0200	39/975	7H	61.1	8.1	1000	3	+1

* = standard mean nursery flour protein = 11.8 mill used = Quad

SAMPLE#	BREEDER#	MTYPE	BABS	MTIME	LVOL	BCRGR	PROQ
0201	39/981	5H	63.2	5.6 -	970	5	+1
0202	39/992						
0203	39/1000						
0204	39/1006	2H	60.2	2.4 -2	980	4	+1
0205	39/1007						
0206	39/1009						
0207	39/1012						
0208	39/1014						
0209	39/1015						
0210	39/1025	4H	65.4 +	4.7 -2	975	4	+1
0211	39/1028						
0212	39/1029						
0213	39/1030	5H	64.2	4.8 -2	1010 +	4	+1
0214	39/1032	5H	65.3 +	4.8 -2	930	6	0
0215	39/1033	5H	63.2	5.1 -2	990 +	4	+1
0216	39/1035						
0217	39/1036						
0218	39/1051	5H	69.1 +2	5.0	925 -2	4	0
0219	39/1086	5H	65.2 +	6.1 -	1075 +2	3	+1
0220	39/1089	6H	64.6 +	6.6 -	1045 +2	3	+1

* = standard mean nursery flour protein = 11.8 mill used = Quad

HRS	62.1	8.0	947	4
HRS	63.8	5.3	999	4
HRS	1.73	1.69	61.0	1.1
HWS	62.8	6.2	1030	3
HWS	63.3	5.6	1006	4
HWS	1.71	1.37	49.8	0.9
HWS	62.8	6.2	1030	3
SWS	61.1	5.4	1025	5
SWS	2.16	1.23	52.2	0.6
HRS	62.1	8.0	947	4
SRS	62.9	5.1	1000	5
SRS				

COMMENTS: Quality parameters of HWS and SWS selections in this nursery were graded by comparison to the standard mean of Klasic. Quality parameters of HRS and SRS selections were graded by comparison to the standard mean of Serra. Breeder #'s 39/794, 39/930 and 39/936 had NIR wheat hardness value less than 50 and were classified as SWS. Breeder #39/857 had NIR wheat hardness value less than 50 and was classified as SRS. All selections in this nursery were milled. Those selections which had flour yield of 63.9% or less were excluded from further testing. Bread was baked on all remaining lines. Loaf volume of most lines was significantly higher than that expected for their flour protein content as graded by their Protein Quality (PROQ) rating. The mean nursery flour protein content was 11.8%. At this level one should expect loaf volume to be near 910 cc, if the protein is of good quality. Bread crumb grain score of many lines was judged to be generally comparable to that of their respective standard mean. The dough mix time (MTIME) of the standard mean (Serra) was very long (8 min.). Several HRS selections were "flagged" since their mixing times were considerably shorter than that of the standard mean, even though most had acceptable dough mixing time (longer than four minutes). One concern often heard about Klasic from some of the U.S. commercial milling and baking trade is its low baking (water) absorption. This is also a concern for future hard white and red variety releases.

SAMPLE#	BREEDER#	MTYPE	COOI	TGS	BABS	MTIME	LVOL	BCRGR	PROQ	RVA	COLOR*
*0001	1	2M	9.04	8						144	
0002	2	1M	8.76 -	7 -						175	S
0003	3	4M	8.81 -	7 -	58.2	3.7	955	3	+1	177	
*0004	4	2M	9.41	9						194	
0005	5	1M	8.84 -	8						266	
0006	6	3H	9.09	7 -	55.3	5.5	975	4	+1	216	
0007	7	3M	8.89 -	7 -						203	
0008	8	4M	9.10	8						196	
0009	9	1M	9.07	8						265	
*0010	10	2M	9.09	8						172	
0011	11	3M	8.73 -	4 -2						206	
0012	12	3M	8.85 -	7 -						249	
0013	13	4H	9.00	5 -2	58.6	4.7	930	4	+1	176	Q
0014	14	2M	8.59 -2	6 -2						178	
0015	15	1H	8.91 -	6 -2						198	
0016	16	2H	8.72 -	7 -	61.2	1.3	800	8	-1	199	U

* = standard mean nursery flour protein = 11.1 mill used = Quad

SWS	9.18	8	170
SWS	8.95	7	201
SWS	0.200	1.3	35.3
SWS	9.18	8	170
HWS	8.72	7	199
		8	

COMMENTS: Quality parameters of SWS selections in this nursery were graded by comparison to the standard mean of Twin, Wakanz and Treasure. Cookies were baked on all lines. Breeder #16 had a NIR wheat hardness value of 64 and was classified as HWS. Breeder #'s 3 (Madual), 6, 13 and 16 had mixogram properties which showed possible potential for bread. These lines were baked and the bread quality parameters were compared (not graded) to Madual. Breeder #'s 6 and 13 exhibited bread baking properties somewhat similar to Madual. Breeder #16 had poor mix time, loaf volume and bread crumb grain score.

Rapid Visco Analyzer (RVA) viscosity was determined on all lines. RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable.

Alkaline flour color was scored on those lines which had RVA viscosity equal to 150 or greater and a NIR wheat hardness value equal to 40 or higher. *Color represents an extremely important quality criterion in Asian types of noodles. A preliminary alkaline flour color test was initiated. An alkaline Pekar slick was used to subjectively measure flour color. The Pekar slick was prepared by pressing flour to a smooth surface, immersing in a 1.0% alkaline solution consisting of 60% K₂CO₃ and 40% Na₂CO₃ for 2 minutes. The sample rested at a room temperature of (77°F) for 4 hours before visual observation and scoring. Flours were scored by the following; S = satisfactory, Q = questionable, and U = unsatisfactory. Desirable flour color ranges from bright white through creamy yellow to bright yellow. Any dullness, brown, or greenish casts would be unacceptable. Alkaline flour color (COLOR) is scored only on SWS, HWS and HWS wheats which have a minimum RVA viscosity of 150 and a minimum NIR wheat hardness (UWHRD) value of 40.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
*0001	MCKAY	1	HRS	62.3	81	13.1	70.7	30.8	0.35	87.9	11.0	62.9
0002	WESTBRED	2	HRS	61.5	66	13.3	67.3 -2	25.8	0.34	84.9	11.7	63.2
0003	YECORA ROJO	3	HRS	62.3	61	12.5	67.2 -2	24.2	0.34	84.8	10.8	63.1
0004	SPILLMAN	4	HRS	59.1 -2	70	13.6	70.1	30.2	0.38 -	85.8	12.0	64.3
0005	OR485010	5	HRS	60.7 -	66	12.9	68.9	29.3	0.39 -	84.0 -	11.3	64.1
0006	OR4870456	6	HRS		51	12.0						
0007	OR4870475	7	HRS	61.7	66	13.1	69.0	27.6	0.32 +	87.7	11.5	63.3
0008	OR4870400	8	HRS	62.0	56	12.9	68.5	25.5	0.36	85.1	11.4	64.5
0009	OR4870401	9	HRS	63.3	70	12.4	70.7 +	25.8	0.38 -	86.4	11.2	63.9
0010	OR4870462	10	HRS	61.9	66	13.0	68.1 -	27.1	0.37	84.2 -	11.8	63.9
0011	OR4870469	11	HRS	61.8	77	13.0	65.7 -2	25.2	0.34	83.2 -	11.6	
0012	OR4880189	12	HRS	61.3 -	64	13.8	67.2 -2	28.1	0.36	83.8 -	12.4	66.8 +
0013	OR4870410	13	HRS	61.8	77	12.9	69.8	31.3	0.36	86.5	11.5	63.4
0014	OR4895019	14	HRS		56	11.6						
0015	OR4895025	15	HRS	62.2	69	12.4	66.9 -2	25.5	0.35	84.0 -	11.4	63.1
0016	OR4870251	16	HRS	61.6	69	12.3	63.7 -2	21.6	0.38 -	79.1 -2	10.9	
0017	OR4895103	17	HRS	63.1	69	12.9	66.9 -2	24.8	0.34	84.5	11.5	66.9 +
0018	OR4895011	18	HRS		62	11.9						
0019	OR4895014	19	HRS	62.2	77	12.3	69.4	26.9	0.37	85.5	11.2	62.2
0020	OR4870456	20	HRS	62.0	57	12.7	66.6 -2	25.8	0.32 +	85.2	11.4	63.6
0021	OR4870456	21	HRS	62.1	62	13.1	66.0 -2	25.1	0.32 +	84.6	11.4	64.2
0022	OR4870456	22	HRS	62.2	66	13.6	66.6 -2	25.6	0.39 -	81.6 -2	10.6	62.5
0023	OR4870456	23	HRS		71	11.1 -						
0024	OR4870456	24	HRS		49	12.6						
0025	OR4870456	25	HRS	62.9	85	12.6	66.2 -2	24.7	0.35	83.2 -	12.2	64.1
0026	OR4870456	26	HRS	61.4 -	56	12.6	65.9 -2	30.0	0.41 -2	79.8 -2	11.5	
0027	OR4920002	27	HRS	62.1	76	12.7	66.7 -2	26.6	0.36	83.2 -	11.1	62.6
0028	CUMPAS86	28	HRS	62.3	80	13.3	67.2 -2	28.3	0.38 -	82.7 -	11.5	62.7
0029		29	HRS	62.7	87	12.3	63.5 -2	23.9	0.43 -2	76.2 -2	12.0	
0030	STAR'S'	30	HRS	62.8	92	12.7	66.9 -2	24.7	0.40 -2	81.4 -2	10.9	62.5
*0031	MCKAY	31	HRS	62.6	70	12.5	68.8	30.3	0.33	87.0	10.8	62.7
0032	WESTBRED	32	HRS	63.0	79	13.3	66.5 -2	26.3	0.35	83.6 -	12.1	64.1
0033	OR485010	33	HRS	63.5	79	12.3	67.9 -	29.3	0.38 -	83.5 -	11.1	62.7
0034	Klastic	34	HRS	63.8	60	12.8	67.2 -2	27.9	0.33 +	85.3	11.6	63.9
0035	OR4895109	35	HRS	63.8	73	12.2	67.4 -	27.7	0.39 -	82.4 -	12.1	63.5
0036	OR4343	36	HRS	63.2	82	14.1	65.7 -2	26.1	0.42 -2	79.1 -2	11.5	
0037	OR390037	37	HRS	63.6	78	13.2	67.5 -	31.9	0.35	84.6	12.4	63.9
0038	OR918008	38	HRS	59.7 -2	79	14.2	67.7 -	28.5	0.37	83.8 -	12.4	62.7
0039	OR918019	39	SRS		29	13.5						
0040	OR918020	40	SRS		34	12.7						

* = standard mean nursery flour protein = 11.4 mill used = Quad

SAMPLE#	BREEDER#	MTYPE	BABS	MTIME	LVOL	BCRGR	PROQ
*0001	1	4H	62.6	5.3	960	4	+1
0002	2	5H	65.9	3.9	1000 +	4	+1
0003	3	5H	67.8 +	5.5	950	4	+1
0004	4	3H	66.5 +	4.0	1010 +	4	+1
0005	5	4H	66.3 +	4.8	955	4	+1
0006	6						
0007	7	3H	65.5	3.9	1000 +	5	+1
0008	8	5H	67.7 +	4.2	970	2	+1
0009	9	4H	67.6 +	3.6	910	4	+1
0010	10	3H	66.6 +	4.3	920	5	0
0011	11						
0012	12	8H	69.0 +2	10.0 +2	1005 +	3	+1
0013	13	5H	65.6	7.9 +2	995 +	2	+1
0014	14						
0015	15	2H	65.3	2.6 -	940	4	+1
0016	16						
0017	17	5H	69.1 +2	4.8	1025 +	4	+1
0018	18						
0019	19	3H	65.4	3.1 -	950	5	+1
0020	20	3H	65.8	3.4 -	1015 +	3	+1
0021	21	4H	66.9 +	4.4	1035 +2	4	+1
0022	22	2H					
0023	23						
0024	24						
0025	25	3H	65.8	3.2 -	1030 +2	4	+1
0026	26						
0027	27	3H	64.8	3.4 -	940	4	+1
0028	28	2H	64.9	1.8 -2	870 -	6	0
0029	29						
0030	30	2H	62.7	1.8 -2	790 -2	7	-1
*0031	31	4H	62.9	4.7	930	4	+1
0032	32	4H	67.8 +	4.0	1035 +2	4	+1
0033	33	3H	64.9	3.3 -	950	2	+1
0034	34	5H	66.6 +	5.6	1040 +2	4	+1
0035	35	3H	65.7	3.6	970	4	+1
0036	36						
0037	37	1H					
0038	38	2H	65.9	2.2 -2	920	6	-1
0039	39						
0040	40						

* = standard mean nursery flour protein = 11.4 mill used = Quad

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0041	OR918027	41	HRS	61.5	77	12.3	67.3 -2	25.1	0.44 -2	79.7 -2	10.9	58.5 -
0042	OR918028	42	HRS	61.6	70	12.9	67.3 -2	25.5	0.41 -2	81.3 -2	11.1	60.2
0043	OR918030	43	HRS	61.0 -	80	12.7	69.5	25.1	0.42 -2	83.0 -	11.1	59.5 -
0044	OR918036	44	HRS	60.4 -	68	13.3	64.4 -2	27.7	0.40 -2	78.8 -2	12.1	
0045	OR918037	45	HRS	60.1 -	74	13.3	64.8 -2	28.0	0.42 -2	78.1 -2	12.0	
0046	OR918039	46	HRS	61.1 -	78	13.7	67.5 -	28.7	0.42 -2	80.9 -2	11.9	60.5
0047	OR4910022	47	HRS	62.5	76	12.8	65.3 -2	29.3	0.38 -	80.7 -2	11.1	
0048	OR4910025	48	HRS	62.8	62	12.6	65.3 -2	27.4	0.39 -	80.2 -2	11.3	
0049	OR4910026	49	HRS	61.7	73	13.0	62.6 -2	23.9	0.46 -2	73.7 -2	11.3	
0050	OR4910027	50	HRS	62.5	82	12.5	65.8 -2		0.40 -2	80.2 -2	11.1	
0051	OR4910028	51	HRS	61.8	77	12.3	67.1 -2	27.2	0.31 +2	86.3	10.4	62.2
0052	OR4900041	52	HRS	61.7	73	12.6	66.5 -2	26.3	0.37	82.5 -	11.3	60.7
0053	OR4900153	53	HRS	63.4	79	14.0	67.9 -	29.5	0.39 -	82.9 -	12.6 +	63.0
0054	OR4900045	54	HRS	61.3 -	74	12.9	67.2 -2	24.4	0.40 -2	81.7 -2	11.4	57.5 -
0055	OR3900362	55	HRS		51	12.2						
0056	OR4900049	56	HRS		51	12.8						
0057	OR4900050	57	HRS	63.6	75	12.8	72.7 +2	27.7	0.39 -	87.9	11.4	62.0
0058	STAR"IS"	58	HRS	64.0	74	12.5	66.6 -2	25.2	0.40 -2	81.1 -2	10.6	60.1 -
0059	OR9437417	59	HRS	61.4 -	73	13.0	66.6 -2	24.4	0.39 -	81.6 -2	11.8	58.8 -
*0060	MCKAY	60	HRS	63.9	70	13.0	69.7	29.0	0.34	87.4	11.1	63.4
0061	OR9437419	61	HRS		82	11.9						
0062	OR9437420	62	HRS	61.1 -	76	13.9	67.5 -	27.0	0.41 -2	81.5 -2	12.4	57.4 -2
0063	OR9437426	63	HRS	62.6	65	13.5	66.7 -2	27.6	0.40 -2	81.2 -2	12.0	57.8 -
0064	OR9437427	64	HRS	62.4	88	13.3	64.5 -2	24.6	0.42 -2	77.8 -2	12.4	
0065	OR485010	65	HRS	63.6	88	12.6	66.7 -2	27.0	0.37	82.7 -	11.1	61.8
0066	OR9437430	66	HRS	62.9	83	12.8	65.7 -2	24.6	0.37	81.7 -2	11.4	
0067	OR9437432	67	HRS		61	11.4						
0068	OR9437433	68	HRS		82	11.0 -						
0069	OR9437435	69	HRS	62.0	83	12.8	65.8 -2	24.0	0.39 -	80.7 -2	11.2	
0070	OR9437448	70	HRS	61.9	78	13.1	62.9 -2	23.6	0.39 -	77.7 -2	11.8	
0071	OR9437453	71	HRS	62.7	78	13.3	62.7 -2	20.3	0.37	78.5 -2	11.2	
0072	OR9437456	72	HRS	63.1	84	13.5	61.7 -2	21.7	0.40 -2	75.9 -2	12.1	
0073	OR9437457	73	HRS	63.7	83	13.1	66.4 -2	26.2	0.38 -	81.9 -2	11.1	58.9 -
0074	OR9437459	74	HRS	63.9	76	12.8	66.5 -2	26.0	0.35	83.6 -	11.8	59.5 -
0075	OR9437460	75	HRS	63.3	76	12.5	70.5	29.0	0.38 -	86.2	11.6	60.8
0076	OR9437461	76	HRS	63.6	91	13.5	66.3 -2	27.9	0.37	82.3 -	12.3	57.3 -2
0077	OR9437464	77	HRS	62.5	79	13.7	65.7 -2	25.2	0.37	81.7 -2	11.6	
0078	OR9437465	78	HRS	63.4	85	13.4	66.3 -2	26.8	0.41 -2	80.2 -2	12.2	59.7 -
0079	OR9437466	79	HRS	63.0	78	12.3	67.6 -	27.4	0.41 -2	81.6 -2	11.0	60.9
0080	OR9437467	80	HRS	63.4	71	13.4	67.2 -2	25.0	0.39 -	82.2 -	11.5	61.2

* = standard mean nursery flour protein = 11.4 mill used = Quad

SAMPLE#	BREEDER#	MTYPE	BABS	MTIME	LVOL	BCRGR	PROG
0041	41	2H	63.2	2.2 -2	825 -2	8	0
0042	42	2H	62.9	2.5 -	830 -2	7	-1
0043	43	2H	63.7	2.8 -	895 -	6	+1
0044	44						
0045	45						
0046	46	2H	62.7	1.8 -2	875 -	6	-1
0047	47						
0048	48						
0049	49						
0050	50						
0051	51	5H	65.4	4.3	915	3	+1
0052	52	4M					
0053	53	2H					
0054	54	3M					
0055	55						
0056	56						
0057	57	3H	63.2	2.9 -	995 +	5	+1
0058	58	1H	61.3 -	1.1 -2	760 -2	8	-1
0059	59	3M					
*0060	60	4H	64.1	5.7	980	3	+1
0061	61						
0062	62	2M					
0063	63	2M					
0064	64						
0065	65	4H	64.0	3.4 -	985	3	+1
0066	66						
0067	67						
0068	68						
0069	69						
0070	70						
0071	71						
0072	72						
0073	73	1H					
0074	74	2H	62.7	2.0 -2	915	8	0
0075	75	2H	63.0	2.2 -2	960	6	+1
0076	76	1H					
0077	77						
0078	78	1H					
0079	79	3H	63.1	3.3 -	955	3	+1
0080	80	2H	63.4	2.1 -2	990 +	6	+1

* = standard mean nursery flour protein = 11.4 mill used = Quad

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0081	OR485010	81	HRS	63.9	67	13.3	69.1	28.5	0.37	85.2	10.7	61.6
0082	OR9437470	82	HRS	63.8	69	12.7	63.9 -2	23.5	0.36	80.3 -2	10.3	
0083	OR9437472	83	HRS	62.2	85	13.4	65.4 -2	26.1	0.43 -2	78.2 -2	11.9	
0084	OR9437473	84	HRS	62.2	89	13.4	65.6 -2	26.0	0.43 -2	78.4 -2	12.1	
*0085	MCKAY	85	HRS	64.0	81	12.7	69.8	30.4	0.34	87.5	10.8	62.1
0086	OR4920020	86	HRS	64.0	74	12.9	67.2 -2	24.6	0.40 -2	81.7 -2	11.1	61.5
0087		87	HRS	63.4	77	14.1	69.4	30.9	0.38 -	85.0	12.7 +	62.5
0088	OR4920022	88	HRS	64.2	77	13.0	65.9 -2		0.38 -	81.4 -2	11.0	62.8
0089	OR4920023	89	HRS		49	12.9						
0090	OR4920024	90	HRS	62.5	61	13.1	65.6 -2	29.2	0.41 -2	79.5 -2	11.7	
0091	OR4920026	91	HRS	63.0	84	14.1	67.7 -	27.1	0.41 -2	81.7 -2	12.9 +	63.8
0092	OR4920028	92	HRS	63.2	68	12.4	67.5 -	29.7	0.36	84.1 -	10.9	61.1
0093	OR4920032	93	HRS	64.7	69	13.0	64.2 -2	23.9	0.36	80.6 -2	11.1	
0094	OR4920034	94	HRS	63.1	72	12.1	64.2 -2	24.2	0.42 -2	77.5 -2	9.9	
0095	OR4920035	95	HRS		69	11.9						
0096	OR4920036	96	HRS		79	11.8						
0097	OR4920040	97	HRS	64.2	66	12.3	66.6 -2	29.7	0.34	84.2 -	10.5	62.0
0098	OR4920045	98	HRS		68	11.1 -						
0099	OR4920046	99	HRS		70	11.8						
0100	OR4920047	100	HRS	63.7	55	13.5	69.5	26.1	0.34	87.2	11.0	61.5
*0101	MCKAY	101	HRS	63.1	69	13.2	67.2	25.6	0.41	81.2	11.4	64.3
0102	OR4920048	102	HRS		68	11.8						
0103	OR4920049	103	HRS	61.2 -	72	12.1	67.2 -2	26.2	0.41 -2	81.2 -2	10.6	61.3
0104	OR4920050	104	HRS		52	11.8						
0105	OR4920053	105	HRS	61.8	82	12.3	69.3	26.8	0.42 -2	82.8 -	10.8	61.0
0106	OR4920052	106	HRS	60.3 -	75	13.3	65.8 -2	25.2	0.41 -2	79.7 -2	11.6	
0107	OR485010	107	HRS	61.9	74	13.0	68.0 -	28.2	0.38 -	83.6 -	11.0	61.2
0108	OR4920055	109	HRS	61.6	65	13.4	67.7 -	27.8	0.42 -2	81.2 -2	11.9	59.5 -
0109	YECORA ROJO	110	HRS	63.9	71	13.8	68.3 -	27.7	0.34	86.0	12.0	63.4
0110	OR4920056	111	HRS		70	13.8						
0111	OR4920057	112	HRS	62.0	58	11.8	67.6 -	29.7	0.39 -	82.6 -	10.4	59.4 -
0112	OR4920058	113	HRS	60.8 -	69	12.5	68.1 -	29.7	0.38 -	83.7 -	11.1	57.9 -
0113	SPILLMAN	114	HRS		71	13.4						
0114	OR4870456	115	HRS	63.9	69	11.5	68.6	29.9	0.37	84.7	10.0	61.7
*0115	MCKAY	116	HRS	62.9	72	12.7	71.1	32.0	0.37	87.3	11.0	61.8
0116	Klasic	117	HWS	65.0 +	72	14.3	66.3 -2	29.6	0.32 +	84.9	12.4	63.8

* = standard mean nursery flour protein = 11.4 mill used = Quad

Standard Mean	HRS	63.1	74	12.9	69.6	29.7	0.36	86.4	11.0	62.9
Nursery Mean	HRS	62.5	72	12.8	67.0	26.8	0.38	82.5	11.4	61.9
Nursery Standard deviation	HRS	1.11	9.5	0.68	1.98	2.36	0.030	2.94	0.61	2.10
Standard Mean	HRS	63.1	74	12.9	69.6	29.7	0.36	86.4	11.0	62.9
Nursery Mean	HWS	64.4	66	13.6	66.8	28.8	0.33	85.1	12.0	63.9
Nursery Standard deviation	HWS	0.85	8.5	1.06	0.64	1.20	0.007	0.28	0.57	0.07
Standard Mean	HRS	63.1	74	12.9	69.6	29.7	0.36	86.4	11.0	62.9
Nursery Mean	SRS		32	13.1						
Nursery Standard deviation	SRS		3.5	0.57						

SAMPLE#	BREEDER#	MTYPE	BABS	MTIME	LVOL	BCRGR	PROQ
0081	81	4H	64.8	3.5 -	965	4	+1
0082	82						
0083	83						
0084	84						
*0085	85	3H	64.3	5.5	970	3	+1
0086	86	2H					
0087	87	3H					
0088	88	3H	65.0	3.3 -	940	5	+1
0089	89						
0090	90						
0091	91	2H	66.0	3.3 -	980	5	0
0092	92	3H	63.3	3.0 -	925	4	+1
0093	93						
0094	94						
0095	95						
0096	96						
0097	97	4H	65.2	3.3 -	925	5	+1
0098	98						
0099	99						
0100	100	3H	62.7	5.6	925	2	+1
*0101	101	2H	66.5	2.2	935	4	+1
0102	102						
0103	103	3H	64.5	3.3 -	930	5	+1
0104	104						
0105	105	1H					
0106	106						
0107	107	4H	63.4	4.4	970	3	+1
0108	108	3H	61.7	3.3 -	910	6	0
0109	110	4H	65.6	3.7	1025 +	2	+1
0110	111						
0111	112	2H					
0112	113	3H	60.1 -	3.0 -	840 -2	6	0
0113	114						
0114	115	3H	62.9	3.5 -	890 -	3	+1
*0115	116	4H	62.0	5.5	895	4	+1
0116	117	5H	66.0	5.5	1045 +2	3	+1

* = standard mean nursery flour protein = 11.4 mill used = Quad

HRS	63.7	4.8	945	4
HRS	64.7	3.7	943	4
HRS	1.96	1.53	60.8	1.6
HRS	63.7	4.8	945	4
HWS	66.3	5.6	1042	4
HWS	0.42	0.07	3.5	0.7
HRS	63.7	4.8	945	4
SRS				
SRS				

W. KRONSTAD

PENDLETON, OR

Q

HARD RED SPRING QUALITY

108

NURSERY

YEAR 92

COMMENTS: Quality parameters of MRS selections in this nursery were graded by comparison to the standard mean of McKay. All selections were initially screened for adequate wheat protein content and NIR wheat hardness. Selections with a wheat protein content of 12.0% or less were excluded from further testing. Those selections with a NIR wheat hardness value of 51 or less were also excluded from further testing. All selections which passed this initial screening were milled. The milled selections were screened for milling quality (based on flour yield). Those lines having a flour yield of 65.9% or less were excluded from further testing. Mixograms were run on the lines which passed the milling quality screening. The mixograms were then screened for reasonable (adequate) mixing properties (i.e. mixing time, mixing strength and tolerance, etc.). Those lines which passed mixogram screening were bread baked.

For Breeder #88, the weight of break flour produced was not recorded, thus no break flour yield (BFYELD) was reported for it, however, the flour yield and milling score are valid.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
*0001	Klasic	1	HWS	63.8	58	13.4	64.1	27.5	0.34	81.6	11.8	62.4
0002	OR484013	2	HWS	62.6	81	12.2	64.2	24.9	0.38	79.6	10.7	62.7
0003	OR918062	3	HWS	60.3	71	12.9	61.0	26.7	0.38	76.2	11.2	
0004	OR918063	4	HWS	60.4	65	13.6	60.6	26.8	0.38	75.8	11.7	
0005	OR918074	5	HWS	61.5	75	13.3	63.5	26.9	0.33	81.5	11.3	59.5
0006	OR918083	6	HWS	62.5	89	13.8	62.0	25.2	0.41	75.7	12.3	
0007	OR918085	7	HWS	60.9	72	13.4	64.7	27.1	0.43	77.5	12.0	56.8
0008	OR918090	8	HWS	61.1	51	13.6	63.6	32.9	0.42	76.9	12.2	56.6
0009	OR4910032	9	SWS	62.3	41	14.6	60.9	28.7	0.34	77.0	12.0	
0010	OR4900154	10	SWS	60.4	26	13.8	66.0	42.0	0.39	80.3	13.4	57.8
0011	OR4900157	11	HWS	62.4	70	15.3	65.5	28.5	0.35	82.5	12.1	62.2
0012	OR4900069	12	HWS	61.5	70	12.6	62.9	25.3	0.35	79.8	11.1	
0013	OR4900070	13	HWS	61.5	76	12.5	63.6	25.9	0.37	79.5	11.2	55.9
0014	OR4900075	14	HWS	61.8	75	12.5	62.9	26.2	0.39	77.7	11.0	
0015	OR4900079	15	HWS	62.7	74	14.5	64.0	26.7	0.33	82.0	12.5	57.6
0016	FCIWS	16	HWS	61.4	65	13.7	62.7	25.8	0.41	76.5	11.7	
0017	OR4900085	17	SWS	62.4	31	14.0	64.8	35.8	0.36	80.7	11.9	56.1
0018	OR918049	18	HWS	61.2	61	14.0	65.5	27.7	0.38	80.9	11.8	57.5
0019	OR918050	19	HWS	61.8	62	12.3	64.1	27.1	0.36	80.5	10.8	55.2
*0020	Klasic	20	HWS	63.3	47	13.9	67.9	28.7	0.33	86.1	11.7	60.1
*0021	Klasic	21	HWS	64.2	56	14.9	64.3	28.3	0.30	83.9	12.9	64.4
0022	OR4920062	22	HWS	62.3	81	13.2	64.5	27.7	0.35	81.5	11.6	59.3
0023	OR4920067	23	HWS	62.9	81	13.0	65.0	26.4	0.40	79.4	11.6	61.2
0024	OR4920068	24	HWS	62.8	71	12.8	63.1	24.9	0.39	77.9	10.5	
0025	OR4920071	25	HRS	62.9	73	12.8	64.9	25.4	0.36	81.4	11.1	58.8
0026	OR4920072	26	HWS	63.6	81	13.6	64.8	25.2	0.37	80.7	11.5	59.8
0027	OR4920073	27	HWS	62.5	61	13.0	65.7	28.8	0.40	80.1	11.0	60.3
0028	OR484013	28	HWS	62.8	73	13.5	65.5	26.4	0.38	80.9	11.5	63.7
0029	OR4920074	29	HWS	62.7	70	13.0	69.3	29.6	0.43	82.3	11.0	57.9
0030	OR4920078	30	HWS	61.6	73	12.5	66.0	27.8	0.43	78.9	11.0	56.9
0031	OR4920079	31	HWS	61.6	79	12.7	65.8	29.8	0.35	82.8	11.5	58.2
0032	OR4920084	32	HWS	61.3	77	12.3	63.3	26.0	0.39	78.1	10.8	
0033	OR4920088	33	HWS	61.4	67	13.0	63.6	26.0	0.41	77.4	11.6	57.0
0034	OR4920089	34	HWS	62.7	70	13.4	64.1	26.6	0.40	78.4	11.6	58.3
0035	OR4920090	35	HWS	62.9	61	13.3	65.2	28.5	0.41	79.1	11.4	57.4
0036	OR4920091	36	HWS	62.4	77	12.8	63.8	26.3	0.40	78.1	11.3	54.8
0037	OR4920092	37	HWS	63.2	70	13.0	63.5	24.3	0.43	76.2	11.3	56.1
0038	OR4920021	38	HWS	63.0	69	12.9	63.1	28.4	0.40	77.4	11.5	
0039	OR4920095	39	HWS	63.3	69	12.7	63.2	27.4	0.40	77.5	11.1	
0040	OR4920096	40	HWS	63.8	77	14.3	69.8	30.6	0.38	85.4	13.0	59.0

* = standard mean nursery flour protein = 11.6 mill used = Quad

SAMPLE#	BREEDER#	MTYPE	BABS	MTIME	LVOL	BCGR	PROQ	RVA	COLOR*
*0001	1	5H	61.6	1.3	1005	2	+1	256	q
0002	2	4H	64.9	5.7 +	890 -2	4	+1	239	S
0003	3								
0004	4								
0005	5	2H						185	S
0006	6								
0007	7	2H							
0008	8	3H	58.8 -2	2.4 -	890 -2	5	-1	128	U
0009	9							228	U
0010	10	2H						190	q
0011	11	2H	64.4	2.4 -	1000 -	4	+1	166	q
0012	12								
0013	13	2H	59.1 -2	2.6 -	860 -2	6	0	161	q
0014	14								
0015	15	4H	62.8	3.3	915 -2	5	-1	231	q
0016	16								
0017	17	2H						256	S
0018	18	4M	59.7 -2	3.3	865 -2	6	-1	150	U
0019	19	5M	58.4 -2	3.5	845 -2	6	0	164	U
*0020	20	5H	62.3	3.8	1050	4	+1	274	q
*0021	21	5H	66.6	4.4	1115	4	+1	263	q
0022	22	3H	61.5 -	3.6	900 -2	6	0	185	S
0023	23	3H	63.4	3.0 -	895 -2	5	0	172	S
0024	24								
0025	25	3H	62.0 -	3.5	920 -2	5	+1	172	U
0026	26								
0027	27	3H	62.0 -	3.4	815 -2	6	-1	133	S
0028	28	3H	62.5	3.7	920 -2	5	+1	166	U
0029	29	5H	65.9	4.4	955 -2	3	+1	209	S
0030	30	2H	60.1 -	2.4 -	875 -2	7	0	158	U
		2H						143	U
0031	31	4M	60.4 -	2.5 -	885 -2	6	0	145	U
0032	32								
0033	33	2H	59.2 -2	2.4 -	850 -2	8	-1	121	S
0034	34	2H						114	S
0035	35	4M	59.6 -2	3.4	905 -2	5	0	169	q
0036	36	3H	57.0 -2	3.0 -	865 -2	7	0	117	q
0037	37	2H	58.3 -2	2.5 -	895 -2	6	0	187	q
0038	38								
0039	39								
0040	40	3H	61.2 -	3.4	970 -2	3	0	204	q

* = standard mean nursery flour protein = 11.6 mill used = Quad

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0041	OR4920097	41	HRS	62.4 -	70	13.2	62.1 -2	24.0	0.41 -2	75.8 -2	11.0	
0042	OR4920100	42	HWS	60.8 -2	73	13.5	62.3 -2	25.7	0.42 -2	75.5 -2	11.7	
0043	OR4920104	43	HWS	62.1 -	75	13.8	63.6 -	25.8	0.40 -2	77.9 -2	12.3	61.1
0044	OR4920105	44	HWS	63.1	83	13.9	65.2	26.9	0.35 -	82.2	12.5	59.0 -
0045	OR4920106	45	HWS	63.2	82	12.9	66.5	27.8	0.42 -2	79.9 -	11.0	56.5 -2
0046	OR4920107	46	HWS	61.9 -	71	13.2	66.1	28.2	0.40 -2	80.5 -	11.6	56.3 -2
0047	OR4920109	47	HWS	61.8 -	75	13.5	61.5 -2	24.8	0.42 -2	74.7 -2	11.9	
0048	OR4920110	48	HWS	62.2 -	68	13.6	66.5	29.2	0.39 -2	81.5 -	11.8	55.8 -2
0049	OR4920111	49	HWS	62.7	66	13.1	64.5	27.3	0.42 -2	77.8 -2	11.6	54.1 -2
0050	OR9437475	50	HWS	61.3 -	66	13.8	65.4	29.9	0.43 -2	78.2 -2	12.3	56.0 -2
0051	OR9437476	51	HWS	63.5	76	12.5	67.7 +2	28.3	0.38 -2	83.2	10.9	54.0 -2
0052	OR9437478	52	HWS	62.3 -	80	12.9	64.1 -	26.2	0.40 -2	78.4 -2	11.0	60.0 -
0053	OR9437480	53	HWS	61.6 -	65	13.5	61.3 -2	24.5	0.47 -2	71.9 -2	11.8	
0054	OR9437481	54	HWS	61.9 -	83	12.1 -	70.6 +2	29.0	0.44 -2	83.1	11.1	53.8 -2
0055	OR9437484	55	HWS	59.9 -2	69	13.6	72.9 +2	23.8	0.42 -2	86.6 +	11.8	61.5
*0056	Klasic	56	HWS	64.7	61	13.9	64.9	27.9	0.31	84.0	12.3	65.2
0057	OR484013	57	HWS	62.2 -	75	13.1	64.8	25.7	0.39 -2	79.7 -2	11.5	62.7
0058	OR9437495	58	HWS	62.3 -	73	13.9	63.4 -	26.7	0.39 -2	78.2 -2	11.9	
0059	OR9437497	59	HWS	63.1	72	13.7	64.0 -	25.6	0.38 -2	79.4 -2	11.8	58.5 -
0060	OR9437498	60	HWS	64.0	84	13.6	64.5	24.9	0.38 -2	79.9 -	11.6	59.3 -
0061	OR9437501	61	HWS	63.4	71	13.4	65.5	28.1	0.36 -	82.0	11.1	59.5 -
0062	OR9437509	62	HWS	60.0 -2	66	12.5	62.6 -2	27.4	0.42 -2	75.8 -2	11.1	
0063	OR9437511	63	HWS	63.9	67	13.9	63.0 -2	27.0	0.42 -2	76.2 -2	12.5	
0064	OR9437512	64	HWS	63.4	74	14.2	61.9 -2	25.3	0.42 -2	75.1 -2	12.3	
0065	OR9437516	65	HWS	62.9	68	12.5	64.5	28.1	0.38 -2	79.9 -	10.7	56.3 -2
0066	OR9437518	66	HWS	63.4	61	14.9	64.9	26.0	0.40 -2	79.3 -2	12.3	58.3 -
0067	OR9437519	67	HWS	63.1	73	14.5	64.9	26.0	0.39 -2	79.8 -2	12.5	57.2 -2
0068	OR9437523	68	HWS	62.7	69	12.9	67.1 +	28.1	0.37 -2	83.1	11.0	55.4 -2
0069	OR9437524	69	HWS	63.1	76	12.4	64.4	26.7	0.36 -	80.8 -	10.7	55.5 -2
0070	OR9437525	70	HWS	63.6	67	12.7	64.4	26.4	0.34	81.9 -	10.9	56.7 -2
0071	OR9437531	71	HWS	60.7 -2	71	12.7	61.9 -2	27.5	0.36 -	78.2 -2	10.9	
0072	OR9437532	72	HWS	59.8 -2	56	13.4	60.9 -2	27.7	0.38 -2	76.1 -2	11.3	
0073	OR9437534	73	HWS	61.6 -	70	13.4	63.5 -	23.5	0.38 -2	78.9 -2	11.2	57.9 -
*0074	Klasic	74	HWS	64.6	59	13.4	66.1	28.0	0.32	84.7	11.8	62.3
0075	OR9437536	75	HWS	61.5 -	84	13.3	66.6 +	28.4	0.41 -2	80.5 -	11.5	60.3
0076	OR9437538	76	HWS	61.6 -	68	13.8	64.5	31.4	0.39 -2	79.4 -2	12.4	63.6
0077	OR484013	77	HWS	63.2	73	13.0	65.6	25.9	0.39 -2	80.5 -	11.0	63.0
0078	OR9437546	78	HWS	60.4 -2	70	13.6	65.9	28.4	0.40 -2	80.3 -	12.1	57.8 -
0079	OR9437547	79	HWS	62.9	74	14.3	65.6	29.0	0.40 -2	80.0 -	12.8	62.4
*0080	Klasic	80	HWS	64.7	58	13.2	65.4	28.0	0.32	84.0	11.6	63.4

* = standard mean nursery flour protein = 11.6 mill used = Quad

Standard Mean	HWS	64.2	13.8	65.5	28.1	0.32	84.0	12.0	63.0
Nursery Mean	HWS	62.4	13.3	64.6	27.1	0.39	79.7	11.6	58.8
Nursery Standard deviation	HWS	1.14	0.66	2.13	1.72	0.033	2.83	0.58	2.92
Standard Mean	HWS	64.2	13.8	65.5	28.1	0.32	84.0	12.0	63.0
Nursery Mean	SWS	61.7	14.1	63.9	35.5	0.36	79.3	12.4	57.0
Nursery Standard deviation	SWS	1.13	0.42	2.67	6.66	0.025	2.03	0.84	1.20
Standard Mean	HWS	64.2	13.8	65.5	28.1	0.32	84.0	12.0	63.0
Nursery Mean	HRS	62.7	13.0	63.5	24.7	0.39	78.6	11.1	58.8
Nursery Standard deviation	HRS	0.35	0.28	1.98	0.99	0.035	3.96	0.07	

COMMENTS: Quality parameters of HWS, SWS and HRS selections in this nursery were graded by comparison to the standard mean of Klasic. Breeder #'s 9, 10 and 17 had NIR wheat hardness value less than 50 and were classified as SWS. Breeder #'s 25 and 41 had red seed coat and were classified as HRS. All lines were milled and screened for milling quality (by flour yield). Those lines with a flour yield less than 63.5% were excluded from further testing. Mixograms were determined on those lines which passed the milling quality screening. Lines which exhibited poor mixogram dough characteristics (i.e., short mix time, weak properties, etc.) were excluded from bread baking. Of those selections which were bread baked, most had inferior loaf volume and questionable crumb grain score compared to Klasic.

Rapid Visco Analyzer (RVA) viscosity was determined on all lines which survived the milling quality screening. RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable.

Alkaline flour color (COLOR) was scored on the same lines which had RVA viscosity analysis. *Color represents an extremely important quality criterion in Asian types of noodles. A preliminary alkaline flour color test was initiated. An alkaline Pekar slick was used to subjectively measure flour color. The Pekar slick was prepared by pressing flour to a smooth surface, immersing in a 1.0% alkaline solution consisting of 60% K₂CO₃ and 40% Na₂CO₃ for 2 minutes. The sample rested at a room temperature of (77°F) for 4 hours before visual observation and scoring. Flours were scored by the following; S = satisfactory, Q = questionable, and U = unsatisfactory. Desirable flour color ranges from bright white through creamy yellow to bright yellow. Any dullness, brown, or greenish casts would be unacceptable. Alkaline flour color (COLOR) is scored only on SWW, HWW, SWS and HWS wheats which have a minimum RVA viscosity of 150 and a minimum NIR wheat hardness (UWHRD) value of 40.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPHOT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0001	Kharkof	1	HRW	59.7	61	9.3	62.5 -2	9.8	0.37	69.8 -2	8.6 -	57.7 -
*0002	Elgin	2	CLUB	59.5	47	8.2	72.1	16.3	0.38	81.0	6.9	51.2
*0003	Moro	3	CLUB	58.9	27	8.2	71.0	18.3	0.37	79.2	6.8	51.4
*0004	Nugaines	4	SWW	61.3	32	8.5	68.7	16.7	0.35	75.9	6.8	52.6
*0005	Stephens	5	SWW	59.1	33	9.0	71.7	16.4	0.37	79.3	7.0	52.7
*0006	Tres	6	CLUB	59.8	34	8.1	70.7	17.3	0.36	79.8	6.5	51.6
0007	ORF 75336	7	SWW	59.7	37	8.7	69.7	14.3	0.35	74.0 -	6.9	54.4
*0008	Kmor	8	SWW	58.8	36	8.8	71.8	18.2	0.35	78.5	7.0	54.3
0009	OR 855	9	CLUB	60.9	33	8.6	70.7	15.5	0.34 +	80.1	7.3	52.6
0010	WA 7621	10	CLUB	58.2	30	8.8	70.4	17.7	0.37	77.8 -	7.2	52.6
0011	ORFU83115	11	SWW	59.3	34	8.7	70.3	14.7	0.34	78.3	7.1	54.0
0012	WA 7662	12	SWW	59.6	39	8.2	68.5 -2	13.4	0.32 +	78.6	6.9	53.9
0013	WA 7663	13	SWW	58.3	37	8.1	70.6	16.2	0.32 +	79.6	6.3	52.8
0014	OR833725	14	SWW	59.5	39	8.9	67.7 -2	14.0	0.34	77.0	7.1	53.8
0015	OR833765	15	SWW	59.4	32	8.8	67.5 -2	13.6	0.35	76.5	7.1	54.2
0016	OR840815	16	SWW	59.6	36	9.1	69.5 -	14.2	0.33 +	77.5	7.4	53.8
0017	ID081277	17	SWW	58.8	35	9.0	68.1 -2	13.0	0.36	73.7 -2	7.4	54.3
0018	WA 7686	18	SWW	59.1	33	9.1	69.1 -	13.8	0.33 +	79.0	7.5	55.4
0019	WA 7687	19	SWW	59.2	39	8.9	68.9 -	12.7	0.34	77.7	7.2	54.3
0020	WA 7622	20	CLUB	59.5	30	8.8	69.7 -	14.4	0.30 +2	81.3 +	7.1	53.3
0021	WA 7690	21	SWW	59.6	31	9.6	67.2 -2	14.1	0.35	74.0 -	7.6	54.5
0022	WA 7691	22	SWW	59.7	41	9.2	69.3 -	14.1	0.35	77.9	7.5	54.1
0023	OR850933	23	SWW	59.2	36	8.9	67.0 -2	12.2	0.34	74.2 -	7.5	53.9
0024	OR850594	24	SWW	59.8	37	9.5	68.2 -2	13.3	0.34	76.8	7.7	54.9
0025	OR851048	25	SWW	58.1	34	9.0	67.5 -2	12.8	0.36	73.7 -2	6.6	52.7
0026	OR860303	26	SWW	61.1	34	9.2	67.9 -2	15.2	0.33 +	76.7	7.4	53.7
0027	OR087636	27	CLUB	60.7	39	8.1	69.3 -	16.6	0.34 +	79.4	6.4	51.4
0028	ID085153	28	SWW	59.0	42	8.9	71.0	15.0	0.33 +	79.3	6.9	53.4
0029	WA 7729	29	CLUB	57.8	32	8.4	71.7	16.7	0.35 +	80.6	6.8	51.8
0030	WA 7730	30	SWW	59.8	34	8.8	70.5	18.1	0.32 +	79.7	7.4	54.6
0031	WA 7717	31	SWW	59.7	28	9.5	70.8	15.1	0.37	78.8	7.5	53.9
0032	WA 7695	32	CLUB	59.6	27	9.1	70.1 -	16.4	0.38	76.2 -2	7.0	52.4
0033	WA 7697	33	CLUB	60.6	25	8.5	70.6	16.4	0.34 +	79.8	6.9	53.0
0034	X WH1004	34										
0035	X WH1002	35										
0036	X WH1005	36										
0037	PB185WW1	37	SWW	60.5	35	9.7	70.4	14.1	0.34	78.7	7.5	53.8
0038	OR851139	38	SWW	60.7	31	8.8	72.6 +	15.4	0.33 +	82.5 +2	7.1	54.8
0039	OR857847	39	SWW	58.6	30	9.1	71.4	14.9	0.35	78.6	7.7	54.0
0040	OR860302	40	SWW	60.1	32	10.1	68.9 -	14.3	0.35	74.7 -	7.9	54.0

* = standard mean nursery flour protein = 7.2 mill used = Buhter

SAMPLE#	BREEDER#	MTYPE	CODI	TGS	CAVOL	SCSCOR	VISC	RVA	COLOR
0001	1	4L	7.93 -2	5 -2	1095 -2	60 -2	166 -2	142	
*0002	2	2L	8.75	7	1280	76	62	156	
*0003	3	2L	8.98	7	1275	74	57	147	
*0004	4	2L	9.24	8	1240	67	63	201	
*0005	5	2L	8.95	7	1280	72	46	155	
*0006	6	2L	8.76	6	1285	73	34	165	
0007	7	2L	8.90 -	6 -	1335 +	78	54	169	S
*0008	8	3L	9.34	8	1355	82	51	157	S
0009	9	3L	9.06	7	1315	77	52	192	
0010	10	2L	9.09 +	7	1370 +2	81 +	57	167	
0011	11	3L	8.61 -2	7	1330	77	57	174	
0012	12	4L	8.29 -2	6 -	1255	70	85	145	S
0013	13	5L	8.65 -2	6 -	1340 +	80 +	48	154	S
0014	14	2L	8.89 -	6 -	1205 -2	67 -	62	166	S
0015	15	5L	8.39 -2	6 -	1245 -	71	106 -	176	
0016	16	2L	8.61 -2	6 -	1315	75	66	172	S
0017	17	2L	8.70 -	7	1275	72	63	194	
0018	18	5L	8.62 -2	6 -	1305	74	103	166	
0019	19	3L	8.65 -2	5 -2	1315	76	69	150	S
0020	20	3L	8.56 -	7	1335 +	78	90	197	
0021	21	2L	8.74 -	6 -	1300	75	87	150	
0022	22	2L	8.56 -2	6 -	1330	77	67	169	Q
0023	23	3L	8.16 -2	6 -	1255	71	76	179	Q
0024	24	4L	8.86 -	7	1305	72	91	181	Q
0025	25	3L	8.14 -2	6 -	1230 -	71	73	117	
0026	26	2L	8.79 -	7	1275	73	62	140	
0027	27	4L	9.06	7	1275	75	50	166	
0028	28	3L	8.56 -2	5 -2	1360 +	76	63	156	S
0029	29	2L	8.99	7	1280	71	46	184	
0030	30	4L	8.76 -	7	1305	73	99	159	
0031	31	2L	8.56 -2	7	1250 -	70	79	123	
0032	32	4L	8.68	7	1350 +	78	74	99	
0033	33	4L	8.48 -	7	1305	75	62	168	
0034	34								
0035	35								
0036	36								
0037	37	2M	8.41 -2	6 -	1250 -	71	98	99	
0038	38	3L	8.46 -2	6 -	1285	78	69	139	
0039	39	3L	8.56 -2	6 -	1245 -	70	79	163	
0040	40	2M	8.68 -	6 -	1300	76	99	166	

* = standard mean nursery flour protein = 7.2 mill used = Buhler

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0041	OR856537	41	CLUB	59.8	31	9.6	70.5	16.2	0.34 +	80.1	7.6	54.0
0042	OR855350	42	CLUB	57.6 -	28	9.0	70.9	16.6	0.38	79.4	7.2	52.9
0043	ORFW0333	43	SWW	59.1	33	9.8	71.2	17.0	0.35	76.9	7.5	53.8
* = standard mean nursery flour protein = 7.2 mill used = Buhler												
Standard Mean			SWW	59.7	34	8.8	70.7	17.1	0.36	77.9	6.9	53.2
Nursery Mean			HRW	59.7	61	9.3	62.5	9.8	0.37	69.8	8.6	57.7
Nursery Standard deviation			HRW									
Standard Mean			CLUB	59.4	36	8.2	71.3	17.4	0.37	80.0	6.7	51.4
Nursery Mean			CLUB	59.4	32	8.6	70.6	16.6	0.35	79.6	7.0	52.3
Nursery Standard deviation			CLUB	1.10	6.1	0.46	0.77	1.07	0.024	1.40	0.34	0.88
Standard Mean			SWW	59.7	34	8.8	70.7	17.1	0.36	77.9	6.9	53.2
Nursery Mean			SWW	59.5	35	9.0	69.5	14.7	0.34	77.3	7.2	53.9
Nursery Standard deviation			SWW	0.76	3.4	0.45	1.59	1.57	0.014	2.21	0.37	0.68

SAMPLE#	BREEDER#	MTYPE	CODI	TGS	CAVOL	SCSCOR	VISC	RVA	COLOR*
0041	41	4L	8.54 -	6	1320	77	79	150	
0042	42	2L	8.65	6	1290	72	86	189	
0043	43	2M	8.45 -2	6 -	1285	73	83	190	

* = standard mean nursery flour protein = 7.2 mill used = Buhler

SWW		9.18	8	1292	74	53	171	
HRW		7.93	5	1095	60	166	142	
HRW								
CLUB		8.83	7	1280	74	51	156	
CLUB		8.80	7	1307	76	62	165	
CLUB		0.225	0.5	31.8	2.8	16.9	26.4	
SWW		9.18	8	1292	74	53	171	
SWW		8.65	6	1288	74	74	160	
SWW		0.277	0.7	40.4	3.7	17.4	23.0	

COMMENTS: SWW and CLUB lines in this nursery were made up of a composite of grain (using equal amounts) from Pendleton, OR; Pullman, WA; Moro and Corvallis, OR; and Aberdeen, ID. Grain received from four other locations was not used for various reasons. Grain received from Bonners Ferry, ID had low test weight, possible sprout damage and higher than desired wheat protein content. Grain from Lind, WA (irrigated) was low in test weight and had high sprout damage. Grain from Moscow, ID had very low test weight, high sprout damage and higher than desired wheat protein content. Grain from Kalispell, MT had low test weight, possible sprout damage and higher than desired wheat protein content. Breeder #'s 34, 35 and 36 from HybriTech Seed International, Inc. were not processed for quality. Quality parameters of SWW lines in this nursery were graded by comparison to the standard mean of Nugaines, Stephens and Kmor. Quality parameters of CLUB lines in this nursery were graded by comparison to the standard mean of Elgin, Moro and Tres.

Rapid Visco Analyzer (RVA) viscosity was determined on all lines. RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable.

Alkaline flour color (COLOR) was scored only on those SWW lines which had NIR wheat hardness value near 40 and above and a minimum RVA viscosity of 150. *Color represents an extremely important quality criterion in Asian types of noodles. A preliminary alkaline flour color test was initiated. An alkaline Pekar slick was used to subjectively measure flour color. The Pekar slick was prepared by pressing flour to a smooth surface, immersing in a 1.0% alkaline solution consisting of 60% K₂CO₃ and 40% Na₂CO₃ for 2 minutes. The sample rested at a room temperature of (77°F) for 4 hours before visual observation and scoring. Flours were scored by the following; S = satisfactory, Q = questionable, and U = unsatisfactory. Desirable flour color ranges from bright white through creamy yellow to bright yellow. Any dullness, brown, or greenish casts would be unacceptable. Alkaline flour color (COLOR) is scored only on SWW, HRW, SWS and HWS wheats which have a minimum RVA viscosity of 150 and a minimum NIR wheat hardness (UWHRD) value of 40.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0001	Kharkof	1	HRW	59.0	52	12.4	63.6 -	10.1	0.32	71.7 -2	11.7	62.4
*0002	Wanser	2	HRW	60.0	69	12.4	65.0	9.9	0.32	75.9	11.9	64.3
0003	OR 830282	3	HRW	59.1	72	12.2	63.6 -	6.8	0.39 -2	69.1 -2	10.9	61.7
0004	OR 8522	4	HRW	58.8	58	11.8	62.8 -2	9.4	0.35 -	71.3 -2	10.5	61.1 -
0005	OR 831134	5	HRW	60.4	60	11.9	66.0	8.8	0.32	77.6	11.4	62.6
0006	OR 008718	6	HRW	60.1	73	12.4	69.0 +2	8.4	0.32	82.1 +2	11.0	62.5
0007	OR 840157	7	HRW	60.9	64	11.4	67.7 +2	9.2	0.33	80.3 +2	10.7	61.5 -
0008	OR 841708	8	HRW	57.8 -	80	11.6	64.8	8.8	0.36 -2	72.9 -	10.3 -	60.6 -
0009	ID 000355	9	HRW	59.9	76	12.7	60.6 -2	9.4	0.34 -	67.9 -2	10.9	62.0
0010	ID 000421	10	HRW	61.1	77	13.0	64.8	10.3	0.32	75.4	11.4	64.0
0011	UT 000190	11	SRW	60.6	38	12.0	65.1	14.4	0.28 +	76.6	9.7 -	59.1 -
0012	UT 000303	12	HRW	60.1	68	11.3	65.5	10.4	0.32	75.2	10.6	62.2
0013	OR 860455	13	HRW	58.0 -	75	11.3	61.8 -2	7.3	0.39 -2	64.4 -2	9.6 -	60.7 -
0014	OR 861555	14	HRW	58.6	50	10.7 -	60.5 -2	10.0	0.33	66.8 -2	9.3 -	59.8 -
0015	ID 000433	15	HRW	60.6	67	12.4	65.4	10.5	0.31	77.2	10.7	64.5
0016	ID 000434	16	HRW	60.5	77	12.1	63.2 -	8.1	0.32	71.8 -	10.5	63.5
0017	IDHW 0355	17	HW	60.5	72	13.1	60.3 -2	9.6	0.33	67.4 -2	11.0	64.5
0018	ID 000423	18	HRW	59.8	63	10.9						
0019	Quantum 555	19										
0020	Quantum XNH01401	20										
0021	WA 007658	21	HRW	60.5	71	12.2	67.2 +	10.7	0.33	77.9	10.6	63.7
0022	WA 007678	22	HRW	61.2	70	11.3	63.2 -	9.1	0.34 -	71.7 -2	10.2 -	63.6
0023	WA 007679	23	HW	60.3	72	12.4	61.9 -2	9.4	0.31	71.5 -2	10.4 -	64.4
0024	WA 007680	24	HRW	60.1	72	12.8	61.6 -2	9.3	0.33	69.9 -2	10.7	65.1
0025	DS 000001	25	HRW	60.6	73	12.8	67.4 +2	10.7	0.32	79.6 +	11.1	64.6
0026	WA 007718	26	HRW	59.8	74	12.2	62.1 -2	8.8	0.31	71.7 -2	10.4 -	63.9
0027	ID 000443	27	HRW	60.9	68	12.1	60.7 -2	8.7	0.31	69.8 -2	10.4 -	63.4
0028	ID 000444	28	HRW	60.7	84	12.2	67.7 +2	10.4	0.32	80.2 +2	11.0	64.6
0029	ID 000445	29	HW	60.4	82	12.8	64.7	10.1	0.33	75.4	11.1	66.3
0030	ID 000426	30	HRW	60.7	73	12.0	64.6	9.9	0.33	75.0	10.2 -	63.5
0031	UT 000134	31	HRW	61.3	68	12.8	66.8 +	11.4	0.31	79.5 +	11.0	65.3
0032	UT 000150	32	HRW	59.6	72	12.4	64.0	9.3	0.31	74.0	10.2 -	64.5
0033	UT 182016	33	HRW	60.1	66	11.6	66.4 +	10.7	0.29 +	78.4 +	10.3 -	63.3
0034	OR 860247	34	HRW	60.1	58	12.1	63.6 -	9.3	0.30	73.1 -	10.4 -	60.4 -
0035	OR 870834	35	SRW	58.0 -	41	11.4	62.4 -2	12.3	0.33	67.2 -2	9.5 -	58.2 -2
0036	OR 870859	36	HRW	59.3	62	11.2	60.4 -2	8.6	0.33	66.1 -2	10.5	60.1 -
0037	OR 850513	37	HW	61.4	60	11.0	64.0	9.4	0.33	72.2 -	10.0 -	59.3 -
0038	OR 860126	38	HW	59.8	72	11.1	59.7 -2	7.3	0.33	65.7 -2	9.8 -	59.4 -

* = standard mean nursery flour protein = 10.6 mill used = Buhler

Standard Mean	HRW	60.0	12.4	65.0	9.9	0.32	75.9	11.9	64.3
Nursery Mean	HRW	60.0	12.0	64.3	9.4	0.33	73.8	10.7	62.8
Nursery Standard deviation	HRW	0.91	0.60	2.45	1.07	0.023	4.72	0.56	1.61
Standard Mean	HRW	60.0	12.4	65.0	9.9	0.32	75.9	11.9	64.3
Nursery Mean	SRW	59.3	11.7	63.8	13.3	0.31	71.9	9.6	58.6
Nursery Standard deviation	SRW	1.84	0.42	1.91	1.48	0.035	6.65	0.14	0.64
Standard Mean	HRW	60.0	12.4	65.0	9.9	0.32	75.9	11.9	64.3
Nursery Mean	HW	60.5	12.1	62.1	9.2	0.33	70.4	10.5	62.8
Nursery Standard deviation	HW	0.58	0.97	2.20	1.08	0.009	3.89	0.58	3.22

SAMPLE#	BREEDER#	MTYPE	BABS	MTIME	LVOL	BCRGR	PROQ	FABS	FPEAK	FSTAB	RVA	COLOR*
0001	1	2H	65.6	2.2	875	4	-1	64.6	5.6	5.7		
*0002	2	3H	67.5	3.1	910	4	0	66.5	8.7	6.9		
0003	3	1H	65.9	1.7 -	785 -2	8	-1	63.6	3.5 -	3.6		
0004	4	4M	65.3	2.6	890	4	+1	65.3	6.7	5.1		
0005	5	4H	65.3	3.0	870	3	0	64.4	8.0	10.2		
0006	6	6M	66.7	3.4	815 -2	5	-1	64.9	9.1	7.4		
0007	7	4M	65.7	3.5	840 -	6	0	62.2 -	6.8	8.0		
0008	8	2H	65.8	2.3	815 -2	6	0	65.4	4.7 -	4.5		
0009	9	3H	66.7	3.5	925	5	+1	64.6	13.4 +	9.1		
0010	10	4H	68.7	3.4	950	3	+1	66.0	11.3	9.6		
0011	11	8M	63.3 -	5.7 +	880	4	+1	57.1 -2	14.0 +	15.8 +		
0012	12	5H	66.4	4.8 +	825 -2	5	0	61.7 -	14.9 +	16.5 +		
0013	13	4M	66.9	2.6	815 -2	6	+1	63.7	5.4 -	5.6		
0014	14	4M	64.0 -	3.3	870	4	+1	57.4 -2	5.2 -	9.4		
0015	15	3M	68.7	2.8	935	5	+1	63.1 -	6.7	11.3		
0016	16	4H	68.7	3.5	880	5	+1	66.7	9.0	8.1		
0017	17	3H	68.7	3.6	940	5	+1	65.7	11.5	8.3	140	S
0018	18											
0019	19											
0020	20											
0021	21	2H	68.9	2.3	840 -	6	0	64.3	6.6	6.0		
0022	22	4H	67.8	4.4 +	850 -	6	+1	64.8	13.0 +	8.7	201	S
0023	23	3H	68.6	2.8	855 -	5	+1	65.4	7.3	6.2	183	S
0024	24	4H	69.3	4.4 +	910	4	+1	63.5	12.8 +	16.0 +		
0025	25	2H	68.8	3.0	865 -	5	0	65.2	7.4	7.1		
0026	26	4H	68.1	3.7	955 +	5	+1	64.0	9.9	9.6		
0027	27	5H	67.6	4.8 +	925	4	+1	65.0	12.2 +	13.6 +		
0028	28	3H	68.8	3.1	890	5	+1	64.8	8.0	6.2		
0029	29	5H	70.5 +	4.5 +	915	4	+1	65.5	11.7	12.0	159	Q
0030	30	4H	67.7	4.0	865 -	4	+1	64.7	11.9	8.4		
0031	31	3H	69.5	2.5	955 +	4	+1	69.1	11.2	8.7		
0032	32	4H	68.7	3.5	880	5	+1	66.9	8.3	7.3		
0033	33	6M	67.5	4.0	900	4	+1	62.1 -	11.0	8.5		
0034	34	3M	64.6 -	1.7 -	755 -2	8	-1	63.0 -	4.6 -	3.2		
0035	35	4M	62.4 -2	3.0	875	5	+1	57.1 -2	4.5 -	6.8		
0036	36	2M	64.3 -	2.0	780 -2	7	-1	63.1 -	3.6 -	2.9		
0037	37	2M	63.5 -	2.3	840 -	6	+1	63.2 -	4.5 -	4.4	203	S
0038	38	3M	64.6 -	3.1	680 -2	9	-1	65.6	4.6 -	4.1	157	S

* = standard mean nursery flour protein = 10.6 mill used = Buhler

HRW	67.5	3.1	910	4		66.5	8.7	6.9				
HRW	67.1	3.2	870	5		64.3	8.6	8.1			201	
HRW	1.62	0.86	53.8	1.3		2.09	3.19	3.35				
HRW	67.5	3.1	910	4		66.5	8.7	6.9				
SRW	62.8	4.3	878	4		57.1	9.2	11.3				
SRW	0.64	1.91	3.5	0.7		0.00	6.72	6.36				
HRW	67.5	3.1	910	4		66.5	8.7	6.9				
HWW	67.2	3.3	846	6		65.1	7.9	7.0			168	
HWW	2.98	0.84	101.6	1.9		1.06	3.54	3.26			24.7	

COMMENTS: HRW and HWW lines in this nursery were made up of a composite of grain (using equal amounts) from Pendleton and Moro, OR; Lind, WA (irrigated and dryland); Moscow and Aberdeen, ID; Bozeman and Kalispell, MT; and Logan, UT. Grain received from other locations was not used for various reasons. Grain received from Pullman, WA was low in test weight and wheat protein content. Grain from Corvallis, OR was very low in wheat protein content. Breeder #'s 19 and 20 (lines from Hybri Tech Seed International, Inc.) were not processed for quality. Breeder #18 (1D000423) was inadvertently omitted due to an error. Breeder #'s 11 and 35 had NIR wheat hardness value less than 50 and were classified as SRW. Quality parameters of HRW and HWW lines in this nursery were graded by comparison to the standard mean of Wanser. Bread was baked on all lines. Rapid Visco Analyzer (RVA) viscosity was determined on all HWW lines. RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 95° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable.

Alkaline flour color (COLOR) was scored on all HWW lines. *Color represents an extremely important quality criterion in Asian types of noodles. A preliminary alkaline flour color test was initiated. An alkaline Pekar slick was used to subjectively measure flour color. The Pekar slick was prepared by pressing flour to a smooth surface, immersing in a 1.0% alkaline solution consisting of 60% K₂CO₃ and 40% Na₂CO₃ for 2 minutes. The sample rested at a room temperature of (77°F) for 4 hours before visual observation and scoring. Flours were scored by the following: S = satisfactory, Q = questionable, and U = unsatisfactory. Desirable flour color ranges from bright white through creamy yellow to bright yellow. Any dullness, brown, or greenish casts would be unacceptable. Alkaline flour color (COLOR) is scored only on SWW, HWW, SWS and HWS wheats which have a minimum RVA viscosity of 150 and a minimum NIR wheat hardness (UWHRD) value of 40.

SAMPLE#	BREEDER#	MTYPE	CODI	TGS	BABS	MTIME	LVOL	BCRGR	PROQ	FABS	FPEAK	FSTAB	RVA	COLOR
*0001	1	3H			63.3	4.2	935	3	+1	58.3	5.8	9.5		
0002	7	4H			64.4	4.2	915	3	+1	61.2	11.6	10.3		
*0003	8	4H	7.51	3	66.4	4.3	995	3	+1	51.6	12.0	12.2	238	S
*0004	9	5H			64.4	5.0	960	2	+1	61.4	12.4	14.9		
0005	10	3H			57.9 -2	3.1 -	925	4	0	64.2 +	9.0	8.8		
0006	11	3H	7.83	4	65.3	3.7	965	4	+1	62.5 +2	9.7	9.4	238	Q
0007	12	3H	7.70	3	67.9	3.3	925 -	5	+1	64.2 +2	9.0	7.1	189	S
0008	13	3H			65.7	3.0 -	890 -	5	0	63.0 +	6.0	5.1 -		
0009	14	4H			65.2	3.1 -	910	4	+1	61.6	6.8	10.7		
0010	15	2H			65.2	2.8 -	895 -	6	+1	62.0	5.6 -	3.9 -		
0011	18	4H			63.2	4.2	850 -2	5	+1	61.8	10.9	13.1		
0012	19	4H			65.9	3.9	955	4	+1	61.9	10.2	12.1		
0013	20	5H			66.2 +	4.3	880 -	4	+1	61.0	13.2 +	15.8		
0014	21	3H	7.60	4	66.4	3.2	885 -2	5	0	64.5 +2	7.3 -	3.6 -	203	U
0015	22	4H	7.66	3	66.2	3.3	925 -	5	+1	61.4 +2	9.8	9.7	239	Q
0016	23	3H	7.65	3	65.1	2.6 -	840 -2	5	0	65.3 +2	6.4 -	5.2 -	115	Q
0017	24	3H			67.6 +	3.3	885 -	5	0	64.8 +	7.6	7.4		
0018	25	5H			68.9 +2	7.6 +2	965	3	+1	61.8	19.0 +2	16.3		
0019	26	2H	7.56	4	65.6	3.3	865 -2	5	+1	61.6 +2	9.5	8.1	240	S
0020	28	2H			65.3	2.2 -	840 -2	6	-1	65.4 +	4.6 -	2.3 -		
0021	29	2H	7.58	3	66.6	2.4 -	795 -2	8	-1	65.0 +2	4.0 -2	1.7 -	151	S
0022	31	2H			66.4 +	2.6 -	905 -	4	+1	60.6	6.8	10.1		
0023	32	3H			67.4 +	3.4	905 -	4	0	59.4	9.0	8.2		
0024	36	5H			68.8 +2	4.4	930	4	+1	59.2	13.4 +	18.3		
0025	37	4H			65.8	4.5	835 -2	6	0	61.4	10.1	12.2		
0026	38	4H			67.0 +	3.6	890 -	5	+1	59.9	7.5	12.3		
0027	39	3H			63.8	4.0	910	2	0	64.6 +	9.8	8.1		

* = standard mean nursery flour protein = 10.9 mill used = Buhler

HRS					63.8	4.6	948	2		59.8	9.1	12.2		
HRS					65.4	3.9	904	4		61.8	9.4	10.5		
HRS					2.44	1.17	37.2	1.2		1.95	3.52	4.23		
HWS														
HWS														
HWS														

HWS					7.51	4.3	995	3		51.6	12.0	12.2	238	
HWS					7.64	3.3	899	5		62.0	8.5	7.1	202	
HWS					0.099	0.59	66.1	1.4		4.47	2.47	3.47	47.4	

COMMENTS: HRS and HWS lines in this nursery were made up of a composite of grain (using equal amounts) from Pendleton, OR; Davis, CA; Tetonia and Aberdeen, ID; and Bozeman and Kalispell, MT. Grain received from four other locations was not used for various reasons. Grain received from Bonner's Ferry had questionable test weight. Grain from Moscow, ID had lower than desired wheat protein content. Grain from Pullman, WA was low in test weight. Grain received from Klamath Falls, OR was inadvertently misplaced. Breeder #'s 9, 11, 31 and 47 had NIR wheat hardness values which were less than 50 and are questionable being classified as HRS or HWS.

Quality parameters of HRS lines in this nursery were graded by comparison to the standard mean of McKay and Serra. Quality parameters of HWS lines in this nursery were graded by comparison to the standard mean of Klasic. Bread was baked on all lines. Cookies were baked only on HWS lines.

Rapid Visco Analyzer (RVA) viscosity was determined on all HWS lines. RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable.

Alkaline flour color (COLOR) was scored on only the HWS lines. *Color represents an extremely important quality criterion in Asian types of noodles. A preliminary alkaline flour color test was initiated. An alkaline Pekar slick was used to subjectively measure flour color. The Pekar slick was prepared by pressing flour to a smooth surface, immersing in a 1.0% alkaline solution consisting of 60% K₂CO₃ and 40% Na₂CO₃ for 2 minutes. The sample rested at a room temperature of (77°F) for 4 hours before visual observation and scoring. Flours were scored by the following; S = satisfactory, Q = questionable, and U = unsatisfactory. Desirable flour color ranges from bright white through creamy yellow to bright yellow. Any dullness, brown, or greenish casts would be unacceptable. Alkaline flour color (COLOR) is scored only on SWW, HWW, SWS and HWS wheats which have a minimum RVA viscosity of 150 and a minimum NIR wheat hardness (UWHRD) value of 40.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
*0001	FEDERATION	2	SWS	58.5	29	11.3	70.9	17.3	0.37	80.9	9.1	53.9
*0002	OMENS	3	SWS	61.0	26	11.5	69.2	19.1	0.34	81.9	9.1	53.0
0003	PENAWAWA	4	SWS	60.1	28	11.6	67.4 -2	18.4	0.38 -	73.9 -2	9.0	53.2
*0004	WAKANZ	5	SWS	59.7	34	11.7	69.9	18.1	0.37	77.5	9.3	53.8
0005	WA 7176	6	SWS	59.6	24	11.6	67.4 -2	19.3	0.39 -	71.8 -2	9.1	53.2
0006	ID 392	16	SWS	61.8 +	40	11.5	71.9 +	18.6	0.31 +2	84.0 +	8.9	53.4
0007	ID 408	17	SWS	59.0	39	12.0	69.8	16.7	0.34	80.8	9.5	53.2
0008	ID 410	27	SWS	60.9	39	11.0	72.1 +	15.5	0.32 +	84.6 +2	8.5	53.7
0009	WA 7677	30	SWS	61.5 +	30	11.3	70.0	17.2	0.35	81.9	8.5	53.5
0010	ID 440	33	SWS	60.7	36	11.2	70.2	16.9	0.30 +2	82.6 +	8.4	53.2
0011	ID 441	34	SWS	60.6	35	11.0	69.4	18.5	0.31 +2	81.0	8.5	52.2
0012	ID 429	35	SWS	62.0 +	36	11.7	69.2	16.0	0.30 +2	81.0	8.8	53.2
0013	ML 42	40	SWS	60.8	30	11.9	69.6	19.2	0.32 +	80.7	9.2	53.3

* = standard mean nursery flour protein = 8.9 mill used = Buhler

Standard Mean

Nursery Mean

Nursery Standard deviation

SWS	59.7	30	11.5	70.0	18.2	0.36	80.1	9.2	53.6
SWS	60.5	33	11.5	69.8	17.8	0.34	80.2	8.9	53.3
SWS	1.05	5.3	0.31	1.40	1.25	0.031	3.71	0.35	0.43

SAMPLE#	BREEDER#	MTYPE	COOI	TGS	CAVOL	SCSCOR	VISC	RVA	COLOR*
*0001	2	2M	9.02	7	1325	76	119	184	
*0002	3	2M	9.19	8	1335	74	148	259	
0003	4	2M	9.04	7	1330	77	146	244	
*0004	5	2M	8.90	7	1310	73	134	202	
0005	6	2M	9.22	8	1330	77	88	181	
0006	16	2M	9.38 +	8	1325	77	164	202	Q
0007	17	2M	8.66 -	7	1315	74	167	160	Q
0008	27	2M	9.36 +	7	1305	76	118	212	Q
0009	30	4M	9.19	8	1310	76	156	246	
0010	33	2M	8.79	7	1340	78	129	237	
0011	34	1M	8.94	7	1325	76	98	230	
0012	35	2M	8.61 -	6 -	1325	73	156	248	
0013	40	2M	8.96	7	1355	77	155	204	

* = standard mean nursery flour protein = 8.9 mill used = Buhler

SWS	9.04	7	1323	74	134	215
SWS	9.02	7	1325	76	137	216
SWS	0.245	0.6	13.6	1.7	25.1	30.5

COMMENTS: SWS lines in this nursery were made up of a composite of grain (using equal amounts) from Pendleton, OR; Pullman, WA; Davis CA; and Moscow, Tetonia and Aberdeen, ID. Grain received from four other locations was not used for various reasons. Grain received from Bonners Ferry, ID had low test weight and higher than desired wheat protein content. Grain from Bozeman, MT had higher than desired wheat protein content. Grain from Kalispell, MT indicated possible sprout damage had occurred. Grain from Klamath Falls, OR was inadvertently misplaced. Quality parameters of SWS lines in this nursery were graded by comparison to the standard mean of Federation, Owens and Wakanz. Rapid Visco Analyzer (RVA) viscosity was determined on all lines. RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable.

Alkaline flour color (COLOR) was scored on those lines which had a NIR wheat hardness value near 40 and above and a minimum RVA viscosity of 150. *Color represents an extremely important quality criterion in Asian types of noodles. A preliminary alkaline flour color test was initiated. An alkaline Pekar slick was used to subjectively measure flour color. The Pekar slick was prepared by pressing flour to a smooth surface, immersing in a 1.0% alkaline solution consisting of 60% K₂CO₃ and 40% Na₂CO₃ for 2 minutes. The sample rested at a room temperature of (77°F) for 4 hours before visual observation and scoring. Flours were scored by the following: S = satisfactory, Q = questionable, and U = unsatisfactory. Desirable flour color ranges from bright white through creamy yellow to bright yellow. Any dullness, brown, or greenish casts would be unacceptable. Alkaline flour color (COLOR) is scored only on SWS, HWS and HWS wheats which have a minimum RVA viscosity of 150 and a minimum NIR wheat hardness (UWHRD) value of 40.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPMUT	FYELD	BFYELD	FASH	MSCOR	FPROT	MAES
0001	TYEE	3534	CLUB	52.6 -2	20	11.9 -	66.2	40.7	0.33	84.4	9.8 -	50.9
0002	RELY	3536	CLUB	56.3	20	10.7	67.3	41.7	0.31	87.1	8.7	51.0
0003	HYAK	3538	CLUB	57.2	28	10.4	66.1	39.3	0.28 +	87.5	8.6	55.0 -2
*0004	PAHA	3539	CLUB	58.4	16	9.8	67.8	41.3	0.30	88.3	8.1	48.0
0005	TRES	3561	CLUB	54.7 -	16	12.7 -	64.7 -2	41.2	0.34 -	81.8 -2	9.6	49.6
0006	HYAK	3711	CLUB	57.9	30	11.0	64.7 -2	37.8	0.30	84.4	8.5	55.1 -2
0007	RELY	3712	CLUB	58.4	15	10.0	65.0 -	38.3	0.33	82.9 -	7.9	47.0
*0008	PAHA	3715	CLUB	58.5	27	10.1	65.2	37.0	0.34	82.5	7.8	48.0
0009	TYEE	3866	CLUB	51.2 -2	21	12.1 -	64.5 -2	40.8	0.36 -2	80.3 -2	9.9 -	50.3
*0010	PAHA	3867	CLUB	57.0	12	10.5	67.7	42.3	0.34	85.7	8.9	49.9
0011	HYAK	3869	CLUB	54.7 -	18	12.0 -	66.1	40.1	0.31	85.5	9.6	56.0 -2
0012	TRES	3873	CLUB	56.8	24	9.8	66.8	42.8	0.31	86.4	7.5	46.0 +
0013	RELY	3893	CLUB	54.8 -	11	11.7 -	66.4	42.2	0.34 -	84.0 -	9.1	51.5
0014	3902	3902	CLUB	54.8 -	12	10.9	66.1	40.1	0.30	86.2	8.5	52.8 -
0015	3904	3904	CLUB	55.8 -	16	9.6	67.2	44.2	0.32	86.3	7.1	50.9
0016	3918	3918	CLUB	52.5 -2	17	11.7 -	65.8 -	40.4	0.34 -	83.2 -	9.0	51.3
0017	3922	3922	CLUB	54.0 -2	14	12.2 -	65.8 -	39.7	0.32	84.5	9.4	52.0 -
0018	3927	3927	CLUB	57.4	20	9.9	66.3	42.0	0.27 +2	88.3 +	8.2	49.0
0019	3928	3928	CLUB	57.9	22	11.2	67.3	40.0	0.30	87.7	8.8	49.0
0020	3931	3931	CLUB	58.4	28	11.0	65.7 -	38.6	0.30	85.7	8.5	49.0
0021	3934	3934	CLUB	56.5	32	10.0	65.9 -	40.0	0.28 +	87.2	7.8	48.9
0022	3936	3936	CLUB	58.0	27	10.8	66.3	39.6	0.29 +	87.1	8.8	49.3
0023	3941	3941	CLUB	54.1 -2	14	10.5	67.2	43.1	0.29 +	88.2	8.6	48.6
0024	3945	3945	CLUB	56.9	13	11.6	66.8	39.8	0.29 +	87.7	8.9	49.9
0025	3954	3954	CLUB	57.5	21	10.1	68.7 +	41.8	0.29 +	90.1 +	8.2	49.9
0026	3958	3958	CLUB	58.9	19	10.0	66.8	39.4	0.30	87.1	8.2	49.9
0027	3961	3961	CLUB	57.0	24	10.7	66.2	37.4	0.33	84.4	8.4	48.8
0028	3962	3962	CLUB	58.2	23	9.8	64.2 -2	37.0	0.32	82.5 -	8.0	48.8
0029	3963	3963	CLUB	55.9 -	15	9.7	67.5	41.2	0.31	87.3	8.1	47.9
0030	3986	3986	CLUB	56.9	19	11.2	65.1 -	37.4	0.31	84.3	9.2	48.8
0031	3991	3991	CLUB	55.9 -	22	12.3 -	65.1 -	40.4	0.36 -2	81.1 -2	9.8 -	50.3
0032	3994	3994	CLUB	56.4	32	13.1 -	62.7 -2	38.2	0.36 -2	78.0 -2	10.1 -	50.9
0033	3997	3997	CLUB	56.5	17	12.3 -	64.0 -2	37.5	0.37 -2	79.0 -2	9.9 -	51.4
0034	4005	4005	CLUB	59.7 +	24	10.1	66.2	37.5	0.32	85.0	8.2	50.0
0035	4006	4006	CLUB	59.1	20	9.8	66.9	38.7	0.34 -	84.6	7.8	48.9
0036	4010	4010	CLUB	58.9	29	10.8	63.6 -2	37.1	0.33	81.1 -2	8.5	48.2
0037	4011	4011	CLUB	60.5 +	36	11.2	68.2 +	35.8	0.33	86.9	8.7	48.9
0038	4014	4014	CLUB	58.5	47	10.7	67.3	37.1	0.32	86.4	8.4	47.9
0039	4020	4020	CLUB	58.9	29	10.3	66.2	38.9	0.29 +	86.9	8.6	48.9
0040	4024	4024	CLUB	58.1	21	11.3	66.3	39.7	0.29 +	87.1	8.7	47.9

* = standard mean nursery flour protein = 8.8 mill used = Quad

SAMPLE#	BREEDER#	MTYPE	COOI	TGS	VISC	AMRC
0001	3534	3M	9.06 -	8	112 -	54.8 -
0002	3536	1M	9.26 -	8		52.8
0003	3538	6M	9.16 -	8	164 -2	58.2 -2
*0004	3539	2M	9.77	9	59	51.6
0005	3561	1M	9.18 -	6 -2	78	55.0 -
0006	3711	8M	8.74 -2	7 -	124 -	58.6 -2
0007	3712	2L	9.50	8	48	55.2 -
*0008	3715	2L	9.26	7	46	54.0
0009	3866	3M	8.94 -2	7 -	80	55.6 -
*0010	3867	1M	9.45	9	58	50.4
0011	3869	4L	8.73 -2	6 -2	114 -	58.4 -2
0012	3873	1L	9.29	8	44	56.2 -
0013	3893	1M	9.27	6 -2	73	54.0
0014	3902	5L	9.50	8	86	53.8
0015	3904	6L	9.31	6 -2	66	54.6 -
0016	3918	3M	9.12 -	7 -	72	53.6
0017	3922	3M	9.15 -	7 -	81	52.4
0018	3927	3L	9.32	7 -	57	53.6
0019	3928	2M	9.19 -	8	87	53.2
0020	3931	3L	9.15 -	8	69	53.6
0021	3934	2L	9.21 -	8	64	54.6 -
0022	3936	3M	9.06 -	7 -	81	54.2
0023	3941	3M	9.65	8	90	52.4
0024	3945	4M	8.91 -2	7 -	88	55.2 -
0025	3954	4L	9.43	8	64	53.8
0026	3958	3L	9.18 -	7 -	69	55.4 -
0027	3961	3L	9.32	8	39	54.0
0028	3962	2L	8.86 -2	7 -	48	57.6 -2
0029	3963	4L	9.57	9	65	53.4
0030	3986	2M	9.10 -	7 -	86	53.2
0031	3991	2M	9.11 -	7 -	70	56.6 -
0032	3994	3M	8.89 -2	6 -2	72	55.8 -
0033	3997	2M	9.14 -	7 -	68	54.0
0034	4005	3L	9.11 -	8	64	54.4 -
0035	4006	4L	9.35	9	41	54.4 -
0036	4010	1L	8.95 -2	6 -2	49	56.0 -
0037	4011	2L	8.89 -2	7 -	73	58.0 -2
0038	4014	2M	8.73 -2	7 -	68	56.4 -
0039	4020	2M	9.11 -	8	86	54.8 -
0040	4024	1M	9.12 -	8	81	54.6 -

* = standard mean nursery flour protein = 8.8 mill used = Quad

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0041	4029	4029	CLUB	55.8 -	27	11.8 -	64.5 -2	38.7	0.33	82.2 -	9.2	51.2
0042	4044	4044	CLUB	58.4	19	9.8	66.4	40.4	0.29 +	87.2	7.9	46.9
0043	4045	4045	CLUB	58.9	22	10.6	66.9	41.8	0.31	86.6	8.6	47.8
0044	4048	4048	CLUB	58.8	17	11.1	66.7	39.9	0.30	86.9	8.7	47.9
0045	4053	4053	CLUB	57.2	17	11.2	66.3	41.3	0.34 -	83.9 -	8.6	46.5
0046	4056	4056	CLUB	55.7 -	16	11.0	65.9 -	42.5	0.33	84.0 -	8.8	47.3
0047	4062	4062	CLUB	56.1 -	16	11.3	65.9 -	41.4	0.35 -	82.7 -	8.6	47.2
0048	4065	4065	CLUB	54.5 -	22	10.8	64.9 -	41.8	0.31	84.0 -	8.5	47.9
0049	TYEE	4072	CLUB	54.5 -	20	10.4	67.4	42.5	0.31	87.2	8.3	47.7
0050	4082	4082	CLUB	54.9 -	16	11.3	65.6 -	41.8	0.30	85.5	8.8	46.9
0051	4089	4089	CLUB	56.5	20	11.0	65.5 -	40.4	0.30	85.4	8.8	47.9
0052	4096	4096	CLUB	57.3	21	11.1	65.7 -	39.0	0.28 +	86.9	8.5	48.0
0053	4100	4100	CLUB	58.4	20	10.9	65.6 -	38.0	0.29 +	86.2	8.4	46.9
0054	4107	4107	CLUB	57.7	6	11.2	65.2 -	40.3	0.26 +2	87.6	8.7	48.0
0055	4108	4108	CLUB	56.8	25	10.9	67.8	42.8	0.30	88.3 +	8.7	47.9
0056	4113	4113	CLUB	58.1	21	11.1	68.7 +	41.8	0.27 +2	91.4 +2	8.7	47.9
0057	4114	4114	CLUB	58.1	22	11.4	67.5	41.9	0.28 +	89.2 +	9.1	48.8
0058	4118	4118	CLUB	58.2	33	10.8	66.3	40.2	0.30	86.4	8.7	47.9
0059	4119	4119	CLUB	56.9	8	11.7 -	68.2 +	43.4	0.29 +	89.5 +	8.9	47.3
0060	4129	4129	CLUB	57.4	21	11.6	65.0 -	39.0	0.27 +2	86.7	9.0	47.9
0061	4134	4134	CLUB	56.9	23	11.4	63.3 -2	40.7	0.27 +2	84.5	8.8	47.8
0062	4138	4138	CLUB	56.6	33	11.4	66.7	39.5	0.26 +2	89.5 +	8.9	48.8
0063	4152	4152	CLUB	55.9 -	22	11.6	65.8 -	42.3	0.29 +	86.4	8.7	50.0
0064	4158	4158	CLUB	56.4	21	12.3 -	66.2	45.4	0.24 +2	90.1 +	9.3	49.9
0065	4161	4161	CLUB	57.9	24	12.6 -	66.5	40.5	0.28 +	88.0	9.8 -	52.0 -
0066	4164	4164	CLUB	55.7 -	19	12.8 -	67.0	44.4	0.30	87.3	9.9 -	50.4
0067	4167	4167	CLUB	54.9 -	24	12.4 -	66.7	45.0	0.31	86.3	9.5	50.5
0068	4170	4170	CLUB	55.6 -	23	12.3 -	64.3 -2	41.5	0.30	83.9 -	9.5	48.9
0069	4171	4171	CLUB	53.5 -2	22	13.1 -	64.7 -2	43.3	0.32	83.1 -	9.7	49.9
0070	4176	4176	CLUB	55.5 -	23	11.4	66.7	40.2	0.28 +	88.2	8.9	48.1
0071	4183	4183	CLUB	57.4	24	11.5	64.5 -2	38.8	0.28 +	85.4	8.9	49.4
0072	4187	4187	CLUB	56.4	25	11.8 -	68.0	41.1	0.30	88.6 +	9.1	49.4
0073	4190	4190	CLUB	56.9	27	11.2	67.7	40.2	0.28 +	89.5 +	8.6	50.3
0074	4198	4198	CLUB	54.1 -2	12	12.6 -	66.0	41.7	0.29 +	86.7	9.5	51.3
0075	4200	4200	CLUB	54.3 -2	22	12.9 -	63.8 -2	40.9	0.27 +2	85.2	9.7	51.3
0076	4202	4202	CLUB	50.8 -2	9	12.2 -	63.5 -2	42.5	0.30	82.9 -	9.3	51.0
0077	4204	4204	CLUB	51.4 -2	11	12.5 -	64.6 -2	41.7	0.27 +2	86.2	9.5	52.6 -
0078	4205	4205	CLUB	52.8 -2	18	12.1 -	64.3 -2	41.0	0.27 +2	85.8	9.4	50.1
0079	4210	4210	CLUB	53.5 -2	10	11.6	65.9 -	42.3	0.28 +	87.2	9.1	51.6
0080	4214	4214	CLUB	54.3 -2	18	11.4	60.3 -2	49.7	0.27 +2	80.7 -2	8.9	49.9

* = standard mean nursery flour protein = 8.8 mill used = Quad

SAMPLE#	BREEDER#	MTYPE	COOI	TGS	VISC	ALWC
0041	4029	4M	9.16 -	7 -	53	55.6 -
0042	4044	1L	9.29	8	58	53.4
0043	4045	1M	9.50	9	72	53.2
0044	4048	1M	9.32	9	82	54.0
0045	4053	2L	9.26	8	79	53.2
0046	4056	3M	9.19 -	8	90	56.2 -
0047	4062	2M	9.49	8	93	56.8 -
0048	4065	2M	9.20 -	8	72	58.0 -2
0049	4072	2M	9.36	9	94	55.2 -
0050	4082	2M	9.15 -	8	122 -	54.8 -
0051	4089	1M	9.48	9	101	55.4 -
0052	4096	3M	9.07 -	8	113 -	56.4 -
0053	4100	1M	9.30	8	101	59.4 -2
0054	4107	1M	9.23	8	84	59.2 -2
0055	4108	1M	9.25	7 -	82	57.4 -2
0056	4113	1M	9.24	8	124 -	56.0 -
0057	4114	2M	9.34	8	155 -	57.0 -
0058	4118	2M	9.01 -	8	120 -	58.6 -2
0059	4119	2M	9.24	8	120 -	65.2 -2
0060	4129	3M	9.06 -	8	158 -	57.6 -2
0061	4134	2M	9.05 -	8	128 -	59.8 -2
0062	4138	2M	8.82 -2	8	55	56.0 -
0063	4152	2M	9.46	8	158 -	57.2 -
0064	4158	2M	8.55 -2	6 -2	174 -2	66.8 -2
0065	4161	3M	8.95 -2	7 -	221 -2	58.4 -2
0066	4164	1M	9.04 -	7 -	146 -	60.8 -2
0067	4167	1M	9.36	7 -	110	58.6 -2
0068	4170	1M	9.12 -	7 -	116 -	59.8 -2
0069	4171	2M	9.10 -	7 -	134 -	57.6 -2
0070	4176	3M	8.99 -	8	154 -	54.4 -
0071	4183	3M	9.10 -	8	110	57.2 -
0072	4187	3M	8.82 -2	7 -	155 -	55.4 -
0073	4190	5L	9.12 -	7 -	167 -2	57.8 -2
0074	4198	2M	8.89 -2	6 -2	206 -2	58.2 -2
0075	4200	2M	8.99 -	7 -	232 -2	56.6 -
0076	4202	2M	9.31	8	193 -2	55.8 -
0077	4204	4M	9.16 -	7 -		55.2 -
0078	4205	3M	9.30	8	201 -2	54.4 -
0079	4210	3M	9.00 -	6 -2	192 -2	54.6 -
0080	4214	2M	9.20 -	8	154 -	52.2

* = standard mean nursery flour protein = 8.8 mill used = Quad

1. 姓名	2. 性别	3. 年龄	4. 籍贯	5. 职业	6. 学历	7. 备注
张三	男	25	山东	教师	本科	
李四	女	30	河南	医生	硕士	
王五	男	35	广东	工程师	本科	
赵六	女	40	四川	会计	大专	
孙七	男	45	湖南	农民	小学	
周八	女	50	湖北	工人	初中	
吴九	男	55	浙江	干部	高中	
郑十	女	60	安徽	退休	大学	
冯十一	男	65	江西	商人	高中	
陈十二	女	70	福建	家庭主妇	小学	
林十三	男	75	广西	农民	小学	
黄十四	女	80	贵州	工人	初中	
周十五	男	85	云南	干部	高中	
吴十六	女	90	陕西	退休	大学	
郑十七	男	95	甘肃	商人	高中	
冯十八	女	100	宁夏	家庭主妇	小学	
陈十九	男	105	青海	农民	小学	
林二十	女	110	内蒙古	工人	初中	
黄二十一	男	115	新疆	干部	高中	
周二十二	女	120	西藏	退休	大学	
吴二十三	男	125	海南	商人	高中	
郑二十四	女	130	重庆	家庭主妇	小学	
冯二十五	男	135	四川	农民	小学	
陈二十六	女	140	湖南	工人	初中	
林二十七	男	145	湖北	干部	高中	
黄二十八	女	150	浙江	退休	大学	
周二十九	男	155	安徽	商人	高中	
吴三十	女	160	江西	家庭主妇	小学	
郑三十一	男	165	福建	农民	小学	
冯三十二	女	170	广西	工人	初中	
陈三十三	男	175	贵州	干部	高中	
林三十四	女	180	云南	退休	大学	
黄三十五	男	185	陕西	商人	高中	
周三十六	女	190	甘肃	家庭主妇	小学	
吴三十七	男	195	宁夏	农民	小学	
郑三十八	女	200	青海	工人	初中	
冯三十九	男	205	内蒙古	干部	高中	
陈四十	女	210	新疆	退休	大学	
林四十一	男	215	西藏	商人	高中	
黄四十二	女	220	海南	家庭主妇	小学	
周四十三	男	225	重庆	农民	小学	
吴四十四	女	230	四川	工人	初中	
郑四十五	男	235	湖南	干部	高中	
冯四十六	女	240	湖北	退休	大学	
陈四十七	男	245	浙江	商人	高中	
林四十八	女	250	安徽	家庭主妇	小学	
黄四十九	男	255	江西	农民	小学	
周五十	女	260	福建	工人	初中	
吴五十一	男	265	广西	干部	高中	
郑五十二	女	270	贵州	退休	大学	
冯五十三	男	275	云南	商人	高中	
陈五十四	女	280	陕西	家庭主妇	小学	
林五十五	男	285	甘肃	农民	小学	
黄五十六	女	290	宁夏	工人	初中	
周五十七	男	295	青海	干部	高中	
吴五十八	女	300	内蒙古	退休	大学	
郑五十九	男	305	新疆	商人	高中	
冯六十	女	310	西藏	家庭主妇	小学	
陈六十一	男	315	海南	农民	小学	
林六十二	女	320	重庆	工人	初中	
黄六十三	男	325	四川	干部	高中	
周六十四	女	330	湖南	退休	大学	
吴六十五	男	335	湖北	商人	高中	
郑六十六	女	340	浙江	家庭主妇	小学	
冯六十七	男	345	安徽	农民	小学	
陈六十八	女	350	江西	工人	初中	
林六十九	男	355	福建	干部	高中	
黄七十	女	360	广西	退休	大学	
周七十一	男	365	贵州	商人	高中	
吴七十二	女	370	云南	家庭主妇	小学	
郑七十三	男	375	陕西	农民	小学	
冯七十四	女	380	甘肃	工人	初中	
陈七十五	男	385	宁夏	干部	高中	
林七十六	女	390	青海	退休	大学	
黄七十七	男	395	内蒙古	商人	高中	
周七十八	女	400	新疆	家庭主妇	小学	
吴七十九	男	405	西藏	农民	小学	
郑八十	女	410	海南	工人	初中	
冯八十一	男	415	重庆	干部	高中	
陈八十二	女	420	四川	退休	大学	
林八十三	男	425	湖南	商人	高中	
黄八十四	女	430	湖北	家庭主妇	小学	
周八十五	男	435	浙江	农民	小学	
吴八十六	女	440	安徽	工人	初中	
郑八十七	男	445	江西	干部	高中	
冯八十八	女	450	福建	退休	大学	
陈八十九	男	455	广西	商人	高中	
林九十	女	460	贵州	家庭主妇	小学	
黄九十一	男	465	云南	农民	小学	
周九十二	女	470	陕西	工人	初中	
吴九十三	男	475	甘肃	干部	高中	
郑九十四	女	480	宁夏	退休	大学	
冯九十五	男	485	青海	商人	高中	
陈九十六	女	490	内蒙古	家庭主妇	小学	
林九十七	男	495	新疆	农民	小学	
黄九十八	女	500	西藏	工人	初中	
周九十九	男	505	海南	干部	高中	
吴一百	女	510	重庆	退休	大学	

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0081	4218	4218	CLUB	56.4	26	11.5	66.5		0.28 +	88.0	8.9	50.3
0082	4220	4220	CLUB	55.1 -	61	11.4	66.7	31.9	0.32	85.7	9.2	52.5 -
0083	4225	4225	CLUB	57.0	69	12.1 -	65.6 -	33.0	0.30	85.5	9.4	51.6
0084	4232	4232	CLUB	55.9 -	50	11.0	63.3 -2	31.7	0.29 +	83.2 -	8.5	51.3
0085	4234	4234	CLUB	57.1	41	11.0	65.3 -	36.5	0.29 +	85.8	8.9	51.5
0086	4237	4237	CLUB	57.9	7	10.9	67.0	40.6	0.29 +	88.0	8.6	51.4
0087	4246	4246	CLUB	56.2	10	10.9	67.2	42.5	0.27 +2	89.5 +	8.9	49.1
0088	4249	4249	CLUB	55.7 -	20	10.1	67.5	42.7	0.27 +2	89.9 +	8.4	50.1
0089	4251	4251	CLUB	56.4	16	10.8	66.3	40.9	0.28 +	87.7	8.6	51.4
0090	4252	4252	CLUB	54.8 -	14	10.9	65.7 -	42.4	0.29 +	86.3	8.4	49.8
*0091	PAHA	4254	CLUB	57.5	17	10.3	67.5	42.8	0.30	88.0	8.5	49.8
0092	T'YEE	4259	CLUB	52.9 -2	26	10.5	66.7	43.0	0.28 +	88.2	8.2	49.6
0093	4260	4260	CLUB	56.6	15	10.3	67.1	42.2	0.29 +	88.1	8.4	49.3
0094	4266	4266	CLUB	59.1	11	9.8	64.7 -2	41.5	0.28 +	85.7	7.7	48.3
0095	4268	4268	CLUB	56.6	13	10.5	63.0 -2	39.5	0.29 +	82.9 -	8.0	47.8
0096	4270	4270	CLUB	57.8	10	10.6	65.7 -	43.1	0.28 +	86.9	8.2	48.3
0097	4272	4272	CLUB	55.0 -	17	11.2	65.4 -	41.1	0.27 +2	87.2	8.8	48.5
0098	4274	4274	CLUB	57.9	15	10.3	67.0	41.0	0.27 +2	89.2 +	8.3	48.8
0099	4279	4279	CLUB	54.0 -2	5	11.6	63.8 -2	40.0	0.29 +	83.9 -	8.9	47.9
0100	4280	4280	CLUB	54.6 -	7	11.1	63.6 -2	40.0	0.29 +	83.6 -	8.6	47.3
0101	4282	4282	CLUB	54.3 -2	16	12.0 -	64.8 -2	41.2	0.28 +	85.8	9.2	48.0
0102	4285	4285	CLUB	53.3 -2	4	11.5	64.3 -2	40.4	0.30	83.9 -	8.9	46.6

* = standard mean nursery flour protein = 8.8 mill used = Quad

Standard Mean	CLUB	57.8	18	10.2	67.1	40.9	0.32	86.1	8.3	48.9
Nursery Mean	CLUB	56.3	21	11.2	65.9	40.5	0.30	85.9	8.8	49.5
Nursery Standard deviation	CLUB	1.94	10.1	0.85	1.43	2.56	0.025	2.51	0.57	1.86

SAMPLE#	BREEDER#	MTYPE	COOI	TGS	VISC	AWRC
0081	4218	3M	8.86 -2	7 -	206 -2	54.8 -
0082	4220	2M	8.31 -2	6 -2	169 -2	56.8 -
0083	4225	3M	8.45 -2	6 -2	213 -2	59.2 -2
0084	4232	3L	8.39 -2	6 -2	134 -	59.0 -2
0085	4234	2M	8.70 -2	7 -	158 -	56.6 -
0086	4237	4L	9.40	9	139 -	53.4
0087	4246	2M	9.24	8	148 -	53.8
0088	4249	2L	9.36	9	110	52.8
0089	4251	7M	8.94 -2	8	184 -2	57.2 -
0090	4252	1L	9.27	7 -	74	53.6
*0091	4254	2L	9.41	10	79	49.2
0092	4259	3L	9.21 -	8	100	53.0
0093	4260	2L	9.40	8	77	52.0
0094	4266	2L	9.38	8	76	55.8 -
0095	4268	1L	9.32	8	73	55.4 -
0096	4270	3L	9.43	7 -	98	55.0 -
0097	4272	2M	9.12 -	7 -	134 -	53.4
0098	4274	2M	9.39	7 -	107	54.8 -
0099	4279	1M	9.40	8	80	52.0
0100	4280	2M	9.27	8	112 -	53.2
0101	4282	1M	9.27	7 -	123 -	53.6
0102	4285	1M	9.41	8	109	53.4

* = standard mean nursery flour protein = 8.8 mill used = Quad

CLUB	9.47	9	60	51.3
CLUB	9.16	8	106	55.5
CLUB	0.256	0.9	45.9	2.66

COMMENTS: Quality parameters of CLUB selections in this nursery were graded by comparison to the standard mean of Paha. Test weight of several lines was significantly less than that of the standard mean. This generally resulted in these lines having lower flour yield. Overall, several lines had flour yield and/or milling score significantly less than Paha, however, several were comparable in flour yield and/or milling score. There were a few lines which had significantly higher flour yield and/or milling score. Break flour yield (BFYELD) was not recorded for Breeder #4218. Cookies were baked on all lines. Several lines had cookie diameter and top grain score significantly less than Paha, however, several had cookie diameter and top grain score comparable to Paha. The standard mean Brookfield viscosity value for Paha was 60. Several lines had comparable viscosity, however, several significantly exceeded this value (undesirable). It is desirable to have CLUB lines with low viscosity (30-60 range). Values above 100 would be unacceptable. Breeder #3536 had insufficient flour for the Brookfield viscosity (VISC) analysis. The standard mean AWRC value for Paha was 51.3. Many lines had significantly higher AWRC values. A desirable AWRC range for CLUB selections would be 54-55 or less.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
*0001	TRES	92-1	CLUB	55.4	37	11.2	72.8	19.8	0.35	54.5	9.2	50.9
*0002	PAHA	92-2	CLUB	55.7	30	10.9	73.0	19.6	0.38	80.9	8.7	50.3
0003	HYAK	92-4	CLUB	55.1	27	11.1	71.3 -	19.2	0.32 +2	81.8	8.7	53.7 -
0004	WA7622	92-8	CLUB	54.2	28	10.3	72.0	19.3	0.31 +2	81.9	8.3	50.6
0005	WA7621	92-9	CLUB	55.8	22	11.2	71.7 -	20.1	0.34 +	78.5 -2	8.4	50.7
0006	WA7753	92-13	CLUB	54.6	30	10.8	71.6 -	18.9	0.30 +2	81.2 -	8.7	51.2
0007	WA6581///VPM/M951//2*BARBEE (85X660) W	92-21	CLUB	55.7	27	11.1	72.3	21.4	0.29 +2	84.2 +	8.9	50.4
0008	TRES//WA7164/TRES (85X098) W CAW	92-23	CLUB	56.2	33	11.2	74.2 +	19.4	0.33 +	86.1 +2	8.7	49.6
0009	TRES//WA7164/TRES (85X112) W CBW	92-24	CLUB	57.2	32	11.1	71.6 -	18.1	0.33 +	82.1	8.8	48.6
0010	WA7752	92-26	CLUB	56.2	36	11.6	72.9	18.9	0.32 +2	84.5 +	9.1	49.8
0011	HYAK/4/WA6581///VPM/M951//2*BRB (W)	92-49	CLUB	57.0	41	11.1	73.4	18.2	0.32 +2	84.7 +	9.0	53.9 -
0012	7217-1/4/6581///PAHA/92/6*O//3*O/TSP/	92-53	CLUB	56.7	25	10.9	72.1	24.3	0.33 +	83.2	8.4	50.7
0013	7217/4/6581///MOR//13645/2CH/AE/PN/2*O	92-57	CLUB	53.7 -	26	12.0	72.9	25.1	0.31 +2	86.3 +2	9.3	50.6
*0014	LEWJAIN	92-61	SWW	56.9	24	10.8	73.5	19.8	0.32	86.3	9.0	55.3
0015	HILL 81	92-65	SWW	57.4	26	11.0	72.6	18.6	0.33	84.7	8.8	54.8
0016	MADSEN	92-66	SWW	57.0	23	11.8	74.1	16.7	0.35 -	85.7	9.9	56.0
0017	WA7690	92-69	SWW	57.5	29	11.3	71.7 -	17.3	0.33	81.6 -2	9.3	54.9
0018	WA7717	92-70	SWW	55.6	26	11.9	71.5 -	18.7	0.35 -	80.6 -2	9.6	54.9
0019	WA7671	92-68	SWW	55.9	16	11.6	72.7	19.9	0.35 -	81.7 -2	9.3	54.3

* = standard mean nursery flour protein = 9.0 mill used = Buhler

Standard Mean	CLUB	55.5	34	11.1	72.9	19.7	0.37	82.7	8.9	50.6
Nursery Mean	CLUB	55.7	30	11.1	72.4	20.2	0.33	83.1	8.8	50.8
Nursery Standard deviation	CLUB	1.05	5.4	0.40	0.84	2.18	0.023	2.25	0.31	1.47
Standard Mean	SWW	56.9	24	10.8	73.5	19.8	0.32	86.3	9.0	55.3
Nursery Mean	SWW	56.7	24	11.4	72.7	18.5	0.34	83.4	9.3	55.0
Nursery Standard deviation	SWW	0.79	4.4	0.44	1.00	1.29	0.013	2.42	0.40	0.57

SAMPLE#	BREEDER#	MTYPE	CODI	TGS	CAVOL	SCSCOR	VISC	RVA
*0001	92-1	2M	8.36	3	1315	77	103	
*0002	92-2	1M	8.56	6	1370	82	94	
0003	92-4	6L	7.93 -2	5	1270 -	71 -	208 -2	
0004	92-8	2L	8.59	6 +	1370	81	116	
0005	92-9	1L	8.36	5	1260 -2	70 -	91	
0006	92-13	3L	8.38	5	1265 -	72 -	124	
0007	92-21	2M	8.57	6 +	1375	80	122	
0008	92-23	1L	8.90 +	7 +2	1365	77	59	
0009	92-24	1L	8.68	5	1340	76	71	
0010	92-26	1L	8.76 +	7 +2	1380	81	112	
0011	92-49	5L	7.97 -	6 +	1310	75	174 -	
0012	92-53	1L	8.97 +	7 +2	1375	78	74	
0013	92-57	1M	8.90 +	7 +2	1360	78	176 -	
*0014	92-61	3M	8.84	7	1330	75		138
0015	92-65	2M	8.51 -	6	1365	75		121
0016	92-66	2M	8.18 -2	5 -	1300	73		116
0017	92-69	2M	8.36 -	4 -2	1330	76		116
0018	92-70	1M	8.76	6	1350	77		146
0019	92-68	2M	8.54 -	7	1410 +	80		127

* = standard mean nursery flour protein = 9.0 mill used = Buhler

CLUB	8.46	4	1342	80	98
CLUB	8.53	6	1335	77	117
CLUB	0.329	1.2	45.6	3.9	44.6
SWW	8.84	7	1330	75	138
SWW	8.53	6	1348	76	127
SWW	0.245	1.2	37.6	2.4	12.3

COMMENTS: Quality parameters of CLUB selections in this nursery were graded by comparison to the standard mean of Tres and Paha. Quality parameters of SWW selections were graded by comparison to the standard mean of Lewjain. Cookies and Japanese sponge cakes were baked on all lines. Brookfield viscosity (VISC) was determined on all CLUB lines. Rapid visco analyzer (RVA) viscosity was determined on all SWW lines. RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
*0001	TRES	92-1	CLUB	60.4	35	10.2	70.0	17.4	0.33	80.6	8.4	48.7
*0002	PAHA	92-2	CLUB	60.4	48	10.6	73.3	15.4	0.35	85.5	8.7	48.6
0003	HYAK	92-4	CLUB	60.2	53	10.7	71.8	15.5	0.30 +	84.9 +	8.4	51.3
0004	WA7622	92-8	CLUB	59.1	35	10.4	72.2	17.1	0.33	83.1	8.3	50.3
0005	WA7621	92-9	CLUB	61.1	38	11.3	71.3	14.8	0.34	82.3	8.6	48.9
0006	WA7753	92-13	CLUB	59.7	44	10.9	71.4	16.5	0.30 +	82.8	8.9	49.8
0007	WA6581///VPM/M951//2*BARBEE (85X660) W	92-21	CLUB	60.8	37	11.0	72.6	18.2	0.30 +	85.0 +	8.7	49.9
0008	TRES//WA7164/TRES (85X098) W CAM	92-23	CLUB	59.9	40	12.7 -	70.9	16.3	0.32 +	80.0 -2	9.8	49.3
0009	TRES//WA7164/TRES (85X112) W CBW	92-24	CLUB	62.0	42	12.5 -	69.5 -	16.0	0.31 +	78.7 -2	9.5	48.9
0010	WA7752	92-26	CLUB	60.6	41	11.8	72.6	16.8	0.29 +2	85.0 +	8.9	48.9
0011	HYAK/4/WA6581///VPM/M951//2*BRB (W)	92-49	CLUB	60.5	38	11.3	70.6	14.4	0.29 +2	84.0	8.9	51.6 -
0012	7217-1/4/6581///PAHA/92/6*0//3*0/TSP/	92-53	CLUB	61.3	37	10.8	73.1 +	20.3	0.31 +	87.4 +2	8.3	50.4
0013	7217/4/6581///MOR//13645/2CH/AE/PN/2*0	92-57	CLUB	59.1	36	11.7	73.1 +	20.6	0.29 +2	87.3 +2	9.2	50.1
*0014	LEWJAIN	92-61	SWW	60.9	33	11.4	71.6	17.9	0.33	83.9	8.9	52.3
0015	HILL 81	92-65	SWW	61.2	40	11.3	71.7	13.7	0.35	79.5 -2	9.1	52.3
0016	MADSEN	92-66	SWW	60.2	38	11.3	70.9	13.3	0.34	79.5 -2	8.9	51.6
0017	WA7690	92-69	SWW	59.8	37	12.7	70.2 -	15.6	0.36 -	76.1 -2	9.6	51.8
0018	WA7717	92-70	SWW	58.7 -	32	12.5	70.4 -	15.7	0.35	80.0 -	9.9	53.2
0019	WA7671	92-68	SWW	60.6	38	12.1	73.8 +2	13.8	0.36 -	83.5	9.8	53.1

* = standard mean nursery flour protein = 9.0 mill used = Buhler

Standard Mean	CLUB	60.4	42	10.4	71.7	16.4	0.34	83.1	8.6	48.7
Nursery Mean	CLUB	60.4	40	11.2	71.7	16.9	0.31	83.6	8.8	49.7
Nursery Standard deviation	CLUB	0.83	5.4	0.77	1.23	1.90	0.020	2.68	0.46	0.98
Standard Mean	SWW	60.9	33	11.4	71.6	17.9	0.33	83.9	8.9	52.3
Nursery Mean	SWW	60.2	36	11.9	71.4	15.0	0.35	80.4	9.4	52.4
Nursery Standard deviation	SWW	0.90	3.1	0.63	1.31	1.75	0.012	2.90	0.45	0.66

SAMPLE#	BREEDER#	MTYPE	CODI	TGS	CAVOL	SCSCOR	VISC	RVA
*0001	92-1	1M	8.01	4	1290	73	70	
*0002	92-2	2M	8.45	6	1325	74	56	
0003	92-4	3L	8.15	6	1230 -	67 -	70	
0004	92-8	2L	8.20	6	1315	77	66	
0005	92-9	2M	8.50 +	5	1250 -	71	58	
0006	92-13	3L	8.35	6	1225 -2	70	76	
0007	92-21	2M	8.24	6	1228 -	74	62	
0008	92-23	1M	8.32	5	1250 -	72	70	
0009	92-24	1M	8.14	5	1240 -	70	79	
0010	92-26	1M	8.45	6	1305	75	62	
0011	92-49	4L	8.14	7 +	1255 -	74	64	
0012	92-53	1L	8.77 +2	7 +	1340	74	46	
0013	92-57	2M	8.79 +2	7 +	1375 +	81 +	94	
*0014	92-61	2M	8.73	7	1360	78		144
0015	92-65	2M	7.90 -2	3 -2	1165 -2	64 -2		124
0016	92-66	2M	8.29 -	5 -	1270 -2	72 -		131
0017	92-69	1H	8.10 -2	5 -	1255 -2	72 -		128
0018	92-70	1M	8.43 -	6	1350	76		146
0019	92-68	1H	8.51	4 -2	1155 -2	68 -		144

* = standard mean nursery flour protein = 9.0 mill used = Buhler

CLUB	8.23	5	1308	74	63	
CLUB	8.35	6	1279	73	67	
CLUB	0.240	0.9	49.0	3.5	11.8	
SWW	8.73	7	1360	78		144
SWW	8.33	5	1259	72		136
SWW	0.297	1.4	87.5	5.1		9.6

COMMENTS: Quality parameters of CLUB selections in this nursery were graded by comparison to the standard mean of Tres and Paha. Quality parameters of SWW selections were graded by comparison to the standard mean of Lewjain. Cookies and Japanese sponge cakes were baked on all lines. Brookfield viscosity (VISC) was determined on all CLUB lines. Rapid Visco Analyzer (RVA) viscosity was determined on all SWW lines. RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
*0001	HATTON	104	HRW	62.4	69	12.4	63.0	28.0	0.34	80.4	12.0	62.9
0002	BLIZZARD	105	HRW	61.4	85	14.1	66.9 +2	29.8	0.31 +	86.1 +2	12.2	62.2
*0003	BUCHANAN	106	HRW	59.0	92	14.3	64.0	29.4	0.32	82.5	11.8	61.4
0004	WA7678	107	HRW	61.8	75	14.4	63.7	28.3	0.33	81.7	11.2	62.0
0005	WA7679	108	HRW	59.2	94	14.6	62.6	28.3	0.33	80.5	12.8	64.5
0006	WA7681	109	HRW	60.3	70	14.3	62.7	27.7	0.33	80.6	12.6	62.8
0007	WA7757	110	HRW	59.2	71	14.1	61.9 -	25.3	0.30 +	81.4	13.1	62.6
0008	N8903005	111	HRW	59.2	68	14.2	64.5	28.7	0.32	83.0	12.7	62.9
0009	N8903104	112	HRW	60.9	75	15.5 +	62.6	28.8	0.35	79.5	13.2	64.4
0010	D9000101	113	HRW	60.0	103	14.7	65.8 +2	27.9	0.35	82.8	12.3	61.9
0011	N9000203	114	HRW	60.8	74	13.4	64.1	27.9	0.33	82.1	12.1	63.4
0012	N9000503	115	HRW	60.9	89	13.4	61.6 -	26.1	0.35	78.4 -	12.6	62.9
0013	WA7758	116	HRW	60.6	61	13.3	62.4	28.3	0.33	80.3	12.1	62.0
0014	N9002702	117	HRW	59.6	81	14.2	63.7	31.0	0.35	80.6	12.6	62.5
0015	WA7759	118	HRW	60.2	73	14.0	63.1	27.0	0.34	80.5	12.6	63.4
0016	N9004805	119	HRW	61.2	70	13.7	61.7 -	27.7	0.35	78.5 -	12.4	61.7
0017	WA7760	120	HRW	59.8	58	12.3	62.1 -	26.5	0.30 +	81.6	12.0	61.5
0018	WA7761	121	HRW	62.5 +	81	14.0	62.7	26.6	0.32	81.2	12.3	64.5
0019	N9007101	122	HRW	61.2	84	14.1	62.1 -	26.0	0.37 -	77.9 -	12.6	65.2 +
0020	N9008004	123	HRW	61.0	67	13.1	60.0 -2	25.1	0.31 +	78.9 -	11.5	62.5
0021	D9008011	124	HRW	62.2	72	13.1	62.4	29.0	0.35	79.3 -	12.0	60.5
0022	WA7762	125	HRW	61.2	72	13.0	61.7 -	26.9	0.36 -	78.0 -	10.8	62.2

* = standard mean nursery flour protein = 12.2 mill used = Quad

Standard Mean

Nursery Mean

Nursery Standard deviation

80

75

9.2

13.3

13.8

0.76

63.5

62.9

1.47

28.7

27.7

1.58

0.33

0.33

0.019

81.4

80.8

1.95

11.9

12.3

0.51

62.2

62.8

1.05

Standard Mean

Nursery Mean

Nursery Standard deviation

80

75

9.2

13.3

13.9

0.93

63.5

63.1

1.82

28.7

28.0

0.88

0.33

0.35

0.013

81.4

80.2

2.04

11.9

12.0

0.85

62.2

62.3

1.66

SAMPLE#	BREEDER#	MTYPE	BABS	MTIME	LVOL	BCRGR	PROQ	RVA	COLOR*
*0001	104	3H	65.1	3.4	920	4	0		
0002	105	4H	64.4	4.1	885	5	-1		
*0003	106	3H	63.6	3.5	920	5	0		
0004	107	5H	65.2	4.7	890	4	0		
0005	108	3H	66.7 +	3.5	930	4	-1	240	S
0006	109	3H	65.0	3.3	900	4	-1		
0007	110	5H	64.8	4.6	905	5	-1		
0008	111	6H	65.1	5.6 +	875 -	5	-1		
0009	112	5H	66.6	4.4	915	4	-1		
0010	113	3H	64.1	3.1	850 -	4	-1	198	U
0011	114	3H	64.6	3.3	850 -	6	-1		
0012	115	4H	65.1	4.5	850 -	5	-1		
0013	116	6M	64.2	3.9	880	5	-1		
0014	117	3H	64.7	2.9	925	4	-1		
0015	118	3H	65.6	3.5	885	5	-1		
0016	119	3H	64.2	2.8	855 -	5	-1		
0017	120	5H	63.7	5.0 +	865 -	5	-1		
0018	121	4H	66.7 +	4.2	870 -	4	-1		
0019	122	5H	67.4 +	4.8 +	870 -	5	-1		
0020	123	7H	64.7	6.6 +2	755 -2	6	-1		
0021	124	6M	62.7	3.7	825 -2	6	-1	205	S
0022	125	5H	63.9	5.9 +	785 -2	4	-1	222	S
* = standard mean nursery flour protein = 12.2 mill used = Quad									
HRW			64.3	3.5	920	4			
HRW			65.0	4.2	879	5			
HRW			1.01	0.98	39.2	0.6			
HRW			64.3	3.5	920	4		216	
HRW			64.3	4.1	848	4		18.8	
HRW			1.68	1.26	61.2	1.0			

COMMENTS: Quality parameters of HRW and HRW selections in this nursery were graded by comparison to the standard mean of Hatton and Buchanan. Some selections had very high NIR wheat hardness value, i.e., Breeder #113 had a value of 103. Most selections in this nursery had loaf volume significantly below that expected for their flour protein content as graded by their Protein Quality (PROQ) rating. The mean nursery flour protein content was 12.2%. At this flour protein level, one should expect a loaf volume near 930cc, if the protein is of good quality. Rapid Visco Analyzer (RVA) viscosity was determined on the HRW lines. RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable.

Alkaline flour color (COLOR) was scored on the HRW lines. *Color represents an extremely important quality criterion in Asian types of noodles. A preliminary alkaline flour color test was initiated. An alkaline Pekar slick was used to subjectively measure flour color. The Pekar slick was prepared by pressing flour to a smooth surface, immersing in a 1.0% alkaline solution consisting of 60% K₂CO₃ and 40% Na₂CO₃ for 2 minutes. The sample rested at a room temperature of (77°F) for 4 hours before visual observation and scoring. Flours were scored by the following; S = satisfactory, Q = questionable, and U = unsatisfactory. Desirable flour color ranges from bright white through creamy yellow to bright yellow. Any dullness, brown, or greenish casts would be unacceptable. Alkaline flour color (COLOR) is scored only on HRW, HRW, SWS and HRW wheats which have a minimum RVA viscosity of 150 and a minimum NIR wheat hardness (UWHRD) value of 40.

SAMPLE#	VARIETY	BREEDER#	CLASS	%BRAN	%MDDS	%BFYELD	%PFYELD
0001	HATTON	126	HRW	20.0	49.6	30.4	80.0
0002	BLIZZARD	127	HRW	19.3	51.5	29.2	80.7
0003	BUCHANAN	128	HRW	21.6	51.5	26.9	78.4
0004	WA7678	129	HRW	20.7	49.1	30.2	79.3
0005	WA7679	130	HRW	21.0	48.8	30.3	79.0
0006	WA7681	131	HRW	21.1	49.3	29.7	78.9
0007	WA7757	132	HRW	22.2	44.8	33.0	77.8
0008	N8903005	133	HRW	20.2	49.9	30.0	79.8
0009	N8903104	134	HRW	20.7	48.6	30.8	79.3
0010	D9000101	135	HRW	19.5	51.7	28.8	80.5
0011	N9000203	136	HRW	19.4	49.8	30.8	80.6
0012	N9000503	137	HRW	21.0	47.6	31.3	79.0
0013	WA7758	138	HRW	21.9	48.2	29.9	78.1
0014	N9002702	139	HRW	20.7	49.9	29.4	79.3
0015	WA7759	140	HRW	20.6	47.7	31.7	79.4
0016	N9004805	141	HRW	20.6	49.9	29.6	79.4
0017	WA7760	142	HRW	21.7	47.5	30.8	78.3
0018	WA7761	143	HRW	19.8	47.3	32.9	80.2
0019	N9007101	144	HRW	20.2	45.9	34.0	79.8
0020	N9008004	145	HRW	21.2	43.4	35.4	78.8
0021	N9008011	146	HRW	19.4	47.6	33.0	80.6
0022	WA7762	147	HRW	22.2	49.3	28.6	77.8

mill used = Quad

COMMENTS: Selections in this nursery were milled on the Short Flow Quadrumat milling system. Wheat samples (approximately 100g each) were conditioned (tempered) by placing the wheat (in envelopes) into a 35°F cold room for sufficient time to bring the wheat moisture content to 14.5%. The conditioned wheat was then ground only through the Quadrumat break rolls. Sifting of the break stock was as described: The bran was removed after 1 minute sifting time. The middling stock was removed after an additional 2 minutes (3 minutes total) sifting time. This is the standard sifting schedule used in our Modified Quadrumat SR. Milling Procedure. No test weight was recorded for selections in this nursery. Reported data is percent bran (% BRAN), percent break flour yield (% BFYELD), percent unground middling stock (% MDDS), and percent potential flour yield (% PFYELD). See brief description of reported data below:

% Bran: The percentage by weight of the total products recovered as bran.

% Break Flour: The percentage by weight of the total products recovered as flour off the break rolls.

% Unground Middling Stock: The percentage by weight of the total products recovered as unground middling stock.

% Potential Flour Yield: The percentage by weight of the total products recovered as break flour and unground middling stock.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MAES
0001	N9100104	1	HRW	60.9	65	13.8	65.0 +	30.7	0.37	80.9	13.2	66.0
0002	N9100901	2	HRW	61.5	69	15.1	65.8 +2	31.4	0.37	81.8	13.5	66.0
0003	N9101201	3	HRW	61.9	73	14.9	66.7 +2	29.0	0.34	84.3 +2	13.2	65.1
0004	N9101301	4	HRW	62.3	73	12.8 -	66.7 +2	29.9	0.34	84.3 +2	13.4	66.0
0005	D9102003	5	HRW	59.4 -	64	15.5	62.2	25.8	0.36	78.5	13.4	65.1
0006	D9105201	6	HRW	59.7 -	65	15.1	64.5 +	28.3	0.36	80.9	12.9	65.5
0007	N9105701	7	HRW	57.3 -2	69	15.4	64.3	27.7	0.37	80.2	12.1	64.1
*0008	HATTON	8	HRW	62.4	68	15.0	63.2	28.8	0.36	79.6	12.9	64.9
0009	N9100902	9	HRW	60.7	59	15.0	65.0 +	31.4	0.37	80.9	13.7	66.7
0010	N9101503	10	HRW	61.1	75	16.1	62.9	28.8	0.33 +	80.8	13.9	66.7
0011	N9101505	11	HRW	60.8	70	13.6	62.4	28.7	0.34	79.8	13.8	66.7
0012	N9101508	12	HRW	60.8	72	13.9	62.8	28.7	0.33 +	80.7	14.0	67.9 +
0013	N9102104	13	HRW	61.2	65	15.3	65.6 +2	29.5	0.32 +	84.2 +	12.9	65.9
0014	N9103701	14	HRW	59.3 -	66	15.7	61.9 -	27.5	0.33 +	79.8	13.2	65.3
0015	N9103702	15	HRW	59.2 -	70	16.0	61.8 -	26.9	0.32 +	80.2	13.2	66.8
0016	N9104102	16	HRW	57.8 -2	64	15.5	62.5	28.0	0.36	78.9	13.6	66.7
0017	N9104201	17	HRW	59.2 -	52	15.8	61.5 -	26.3	0.35	78.3	12.6	65.9
0018	D9105209	18	HRW	60.9	90	15.6	64.4 +	30.7	0.31 +2	83.5 +	12.8	65.2
0019	N9105504	19	HRW	62.2	71	14.3	65.0 +	30.3	0.35	82.0	12.7	65.8
*0020	HATTON	20	HRW	62.0	73	15.5	63.3	29.5	0.35	80.2	13.1	64.9
0021	N9106002	21	HRW	61.8	71	14.4	64.0	29.9	0.33 +	82.0	13.3	64.8
0022	N9106801	22	HRW	60.4 -	63	16.5 +	62.6	30.2	0.36	79.0	13.5	64.9
0023	N9107301	23	HRW	60.8	62	13.4	62.1 -	27.3	0.33 +	80.0	12.4	62.5
0024	N9107801	24	HRW	61.2	71	14.4	61.8 -	26.8	0.35	78.6	12.9	58.5 -2
0025	N9108301	25	HRW	60.1 -	72	13.7	61.5 -	27.7	0.33 +	79.4	13.0	63.9
0026	N9108401	26	HRW	58.0 -2	60	16.8 +	64.2	31.3	0.35	81.2	14.4 +	65.9
0027	D9108405	27	HRW	58.5 -2	51	13.9	62.5	31.0	0.33 +	80.4	13.7	64.8
0028	N9109004	28	HRW	59.6 -	77	14.6	62.5	27.8	0.37	78.3	13.9	65.9
*0029	HATTON	29	HRW	61.8	69	14.6	63.1	29.1	0.35	80.0	13.1	64.8
0030	N9107401	30	HRW	60.0 -	78	16.2	65.6 +2	31.1	0.35	82.6 +	14.9 +	67.7 +
0031	N9108302	31	HRW	60.2 -	59	14.2	64.5 +	30.0	0.33 +	82.5 +	13.0	65.5
0032	N9108604	32	HRW	58.5 -2	74	14.5	63.0	26.8	0.34	80.4	12.9	64.9
0033	N9109201	33	HRW	59.1 -	78	14.9	62.8	27.2	0.34	80.2	13.4	65.7
0034	N9109403	34	HRW	59.3 -	80	14.7	62.8	29.1	0.35	79.7	13.4	64.7
*0035	HATTON	35	HRW	62.4	77	14.3	63.1	29.4	0.34	80.5	13.2	63.9
0036	N9100105	36	HRW	61.3	72	14.1	63.3	28.3	0.33 +	81.3	13.1	65.8
0037	N9100201	37	HRW	61.5	79	14.4	61.9 -	26.4	0.35	78.8	12.7	64.8
0038	N9101001	38	HRW	60.3 -	58	14.4	63.0	27.7	0.35	79.9	12.8	65.2
0039	N9101002	39	HRW	59.7 -	63	16.1	63.3	26.4	0.36	79.7	13.5	65.2
0040	N9101003	40	HRW	60.4 -	57	15.6	67.0 +2	29.0	0.43 -2	79.9	12.8	62.3

* = standard mean nursery flour protein = 13.1 mill used = Quad

SAMPLE#	BREEDER#	MTYPE	BABS	MTIME	LVOL	BCRGR	PROQ	RVA	COLOR*
0001	1	3H	68.2	2.8	990	5	0		
0002	2	2H	68.2	2.3	925	7	-1		
0003	3	6H	67.3	5.5 +	920	3	-1		
0004	4	6H	66.2	6.2 +2	945	3	-1		
0005	5	7H	67.3	6.5 +2	960	3	-1	223	U
0006	6	4H	67.7	3.1	1005 +	3	+1	218	S
0007	7	6M	66.3	2.9	900 -	5	-1		
*0008	8	3H	67.1	3.3	970	3	0		
0009	9	3H	68.9	3.2	995	4	-1		
0010	10	4H	68.9	3.7	1015 +	3	-1		
0011	11	4H	68.9	3.9	980	2	-1		
0012	12	5H	70.1 +	4.6 +	1020 +	3	-1		
0013	13	3H	68.1	3.1	995	3	0		
0014	14	4H	67.5	4.1	1090 +2	3	+1		
0015	15	4H	69.0	4.1	1040 +2	2	+1		
0016	16	4H	68.9	4.4	1060 +2	4	+1		
0017	17	5H	68.1	4.6 +	1025 +	4	+1		
0018	18	4H	67.4	4.4	930	3	-1	220	S
0019	19	3H	68.0	3.2	975	3	0		
*0020	20	3H	67.1	3.1	965	4	-1		
0021	21	5H	67.0	4.3	1005 +	3	0		
0022	22	3H	67.1	3.6	1055 +2	2	+1		
0023	23	4H	64.7 -	3.9	940	4	0		
0024	24	3H	61.7 -2	3.2	860 -2	8	-1		
0025	25	3H	68.1	3.1	1005 +	4	0		
0026	26	4H	68.1	3.9	1100 +2	2	0		
0027	27	5H	67.5	5.3 +	1045 +2	4	0	227	S
0028	28	2H	68.1	1.5 -	865 -2	8	-1		
*0029	29	3H	68.0	3.2	975	5	0		
0030	30	3H	69.9 +	3.6	1000 +	4	-1		
0031	31	3H	68.2	3.1	1000 +	5	0		
0032	32	3H	67.6	3.3	1045 +2	3	+1		
0033	33	2H	67.4	2.2	930	6	-1		
0034	34	4H	67.4	4.5 +	1005 +	2	0		
*0035	35	3H	68.1	3.1	905	4	-1		
0036	36	3H	67.0	3.1	1100 +2	5	+1		
0037	37	3H	68.0	3.0	995	4	+1		
0038	38	4H	69.4	4.2	960	4	0		
0039	39	5H	69.4	4.8 +	1000 +	4	0		
0040	40	3H	66.5	3.5	980	4	0		

* = standard mean nursery flour protein = 13.1 mill used = Quad

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0041	N9101004	41	HRW	60.3 -	55	15.9	63.1	27.5	0.35	80.0	13.1	65.5
0042	N9103901	42	HRW	59.6 -	61	13.5	63.7	28.6	0.32 +	82.2 +	11.2 -	62.3
0043	D9105101	43	HRW	59.7 -	73	13.7	63.6	24.7	0.36	80.0	11.4 -	60.3 -
0044	N9105401	44	HRW	60.2 -	61	14.4	63.0	26.8	0.37	78.9	12.0	63.8
0045	N9105402	45	HRW	60.1 -	77	12.6 -	63.0	27.2	0.37	78.9	11.9	64.4
0046	D9108406	46	HRW	59.2 -	57	13.6	62.5	195.	0.36	78.9	13.1	64.3
0047	N9108603	47	HRW	60.6	86	14.6	64.4 +	30.6	0.32 +	82.9 +	13.6	65.2
0048	D9108605	48	HRW	59.8 -	87	14.4	62.0 -	27.2	0.32 +	80.4	12.6	63.8
0049	D9109101	49	HRW	59.9 -	86	14.6	62.0 -	27.8	0.33 +	79.9	12.9	62.8
0050	N9109401	50	HRW	60.3 -	100	15.0	62.2	28.0	0.35	79.1	13.0	63.7
0051	N9109402	51	HRW	59.2 -	77	13.8	63.1	26.3	0.36	79.5	12.1	59.8 -
*0052	HATTON	52	HRW	62.6	80	14.2	63.7	28.8	0.36	80.1	12.4	62.3

* = standard mean nursery flour protein = 13.1 mill used = Quad

Standard Mean
Nursery Mean
Nursery Standard deviation

HRW	62.2	73	14.7	63.3	29.1	0.35	80.1	12.9	64.2
HRW	60.5	70	14.8	63.5	28.6	0.35	80.5	13.1	64.9
HRW	1.28	9.0	0.96	1.42	1.50	0.020	1.55	0.67	1.82

Standard Mean
Nursery Mean
Nursery Standard deviation

HRW	62.2	73	14.7	63.3	29.1	0.35	80.1	12.9	64.2
HRW	59.6	72	14.6	63.0	48.8	0.34	80.3	12.8	64.0
HRW	0.68	14.8	0.79	1.05	59.11	0.021	1.52	0.68	1.72

SAMPLE#	BREEDER#	MTYPE	BABS	MTIME	LVOL	BCRGR	PROQ	RVA	COLOR*
0041	41	4H	68.7	3.6	1007 +	4	0		
0042	42	3H	65.5	2.8	880 -	8	0		
0043	43	5H	64.5 -	5.0 +	945	6	+1	222	U
0044	44	4H	67.0	3.6	980	3	+1		
0045	45	5H	66.6	4.1	975	4	+1		
0046	46	5H	66.5	5.3 +	1055 +2	3	+1	222	S
0047	47	3H	67.4	3.5	1055 +2	4	+1		
0048	48	4H	66.0	3.4	960	5	0	265	U
0049	49	3H	65.0 -	3.3	950	5	-1	267	U
0050	50	5H	66.9	4.4	1015 +	4	+1		
0051	51	5H	63.9 -	5.0 +	970	4	+1		
*0052	52	3H	66.5	3.1	965	4	0		

* = standard mean nursery flour protein = 13.1 mill used = Quad

HRW
HRW
HRW

67.4
67.5
1.54

3.2
3.6
0.87

956
986
56.7

4
4
1.5

HRW
HW
HW

67.4
66.5
1.22

3.2
4.5
1.20

956
981
47.6

4
4
1.2

233
20.5

COMMENTS: Quality parameters of HRW and HW selections in this nursery were graded by comparison to the standard mean of Hatton. Most lines had very good to excellent wheat and flour protein content (mean nursery wheat protein = 14.8%; mean nursery flour protein = 13.1%). Bread was baked on all lines. Compared to Hatton, some of these lines had very good loaf volume and crumb grain score.

Rapid Visco Analyzer (RVA) viscosity was determined on all HW lines. RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 95° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable.

Alkaline flour color (COLOR) was scored on all HW lines. *Color represents an extremely important quality criterion in Asian types of noodles. A preliminary alkaline flour color test was initiated. An alkaline Pekar slick was used to subjectively measure flour color. The Pekar slick was prepared by pressing flour to a smooth surface, immersing in a 1.0% alkaline solution consisting of 60% K₂CO₃ and 40% Na₂CO₃ for 2 minutes. The sample rested at a room temperature of (77°F) for 4 hours before visual observation and scoring. Flours were scored by the following; S = satisfactory, Q = questionable, and U = unsatisfactory. Desirable flour color ranges from bright white through creamy yellow to bright yellow. Any dullness, brown, or greenish casts would be unacceptable. Alkaline flour color (COLOR) is scored only on SW, HW, SWS and HWS wheats which have a minimum RVA viscosity of 150 and a minimum NIR wheat hardness (UWHRD) value of 40.

SAMPLE#	VARIETY	BREEDER#	CLASS	%BRAN	%MIDD	%BYELD	%PFYELD
0001	N9100104	53	HRW	21.6	48.9	29.6	78.4
0002	N9100901	54	HRW	20.2	50.4	29.4	79.8
0003	N9101201	55	HRW	19.1	50.0	30.9	80.9
0004	N9101301	56	HRW	18.7	50.9	30.3	81.3
0005	D9102003	57	HRW	19.4	46.7	33.8	80.6
0006	D9105201	58	HRW	20.4	49.3	30.2	79.6
0007	N9105701	59	HRW	20.2	49.8	30.0	79.8
0008	HATTON	60	HRW	20.0	49.9	30.1	80.0
0009	N9101503	61	HRW	21.9	45.6	32.4	78.1
0010	N9101505	62	HRW	22.2	46.1	31.7	77.8
0011	N9101508	63	HRW	21.9	46.2	31.9	78.1
0012	N9102104	64	HRW	20.8	51.4	27.8	79.2
0013	N9103701	65	HRW	22.3	47.2	30.5	77.7
0014	N9103702	66	HRW	22.2	48.5	29.2	77.8
0015	N9104102	67	HRW	23.3	46.9	29.9	76.7
0016	N9104201	68	HRW	22.5	47.4	30.1	77.5
0017	D9105209	69	HRW	21.7	52.3	26.0	78.3
0018	N9105504	70	HRW	21.5	51.1	27.3	78.5
0019	HATTON	71	HRW	21.3	46.9	31.8	78.7
0020	N9106002	72	HRW	19.0	51.2	29.7	81.0
0021	N9106801	73	HRW	20.8	51.1	28.1	79.2
0022	N9107301	74	HRW	19.3	50.2	30.5	80.7
0023	N9107801	75	HRW	19.7	48.8	31.5	80.3
0024	N9108301	76	HRW	21.0	48.8	30.2	79.0
0025	N9108401	77	HRW	20.1	50.9	29.0	79.9
0026	D9108405	78	HRW	20.8	50.6	28.6	79.2
0027	N9109004	79	HRW	21.0	48.8	30.2	79.0
0028	HATTON	80	HRW	20.1	49.3	30.6	79.9
0029	N9107401	81	HRW	20.0	48.9	31.1	80.0
0030	N9108302	82	HRW	22.2	50.4	27.4	77.8
0031	N9108604	83	HRW	20.5	49.4	30.0	79.5
0032	N9109201	84	HRW	21.0	49.3	29.7	79.0
0033	N9109403	85	HRW	22.8	47.9	29.3	77.2
0034	HATTON	86	HRW	20.0	48.1	31.9	80.0
0035	N9100105	87	HRW	21.3	44.8	33.9	78.7
0036	N9100201	88	HRW	20.2	45.4	34.3	79.8
0037	N9101001	89	HRW	20.5	46.3	33.2	79.5
0038	N9101002	90	HRW	19.3	43.6	37.1	80.7
0039	N9101003	91	HRW	20.7	45.2	34.1	79.3
0040	N9101004	92	HRW	20.6	46.5	32.9	79.4

mill used = Quad

mill used = Quad

COMMENTS: Selections in this nursery were milled on the Short Flow Quadrumat milling system. Wheat samples (approximately 100g each) were conditioned (tempered) by placing the wheat (in envelopes) into a 35°F cold room for sufficient time to bring the wheat moisture content to 14.5%. The conditioned wheat was then ground only through the Quadrumat break rolls. Sifting of the break stock was as described: The bran was removed after 1 minute sifting time. The middling stock was removed after an additional 2 minutes (3 minutes total) sifting time. This is the standard sifting schedule used in our Modified Quadrumat SR. Milling Procedure. No test weight was recorded for selections in this nursery. Reported data is percent bran (% BRAN), percent break flour yield (% BFYELD), percent unground middling stock (% MIDDS), and percent potential flour yield (% PFYELD). See brief description of reported data below:

% Bran: The percentage by weight of the total products recovered as bran.

% Break Flour: The percentage by weight of the total products recovered as flour off the break rolls.

% Unground Middling Stock: The percentage by weight of the total products recovered as unground middling stock.

% Potential Flour Yield: The percentage by weight of the total products recovered as break flour and unground middling stock.

SAMPLE#	VARIETY	LOCATION	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0001	PENAWAWA	Dayton	SWS	56.3	15	12.1	63.8	39.9	0.40	76.9	10.2	54.3
0002	UC657	Dayton	CLUB	56.5	17	12.5	64.8	41.7	0.38	79.4	10.4	53.1
0003	PENAWAWA	Dusty	SWS	51.5	10	13.9						
0004	UC657	Dusty	CLUB	45.6	25	15.0						
0005	PENAWAWA	Lamont	SWS	53.4	15	15.8						
0006	UC657	Lamont	CLUB	53.6	25	16.2						
0007	PENAWAWA	St. John	SWS	55.8	8	13.5	59.9	40.3	0.43	70.0	11.7	55.8
0008	UC657	St. John	CLUB	57.0	9	13.4	64.0	43.7	0.36	79.7	11.3	55.9
0009	PENAWAWA	Farmington	SWS	61.2	19	14.4	62.4	35.0	0.38	76.4	11.5	57.1
0010	UC657	Farmington	CLUB	60.8	24	14.1	63.8	38.4	0.36	79.4	11.2	56.1
0011	PENAWAWA	Moses Lake	SWS	54.9	8	13.1						
0012	UC657	Moses Lake	CLUB	52.6	16	13.2						
0013	PENAWAWA	Bickleton	SWS	60.3	11	13.5	65.0	38.0	0.45	75.2	10.3	53.4
0014	UC657	Bickleton	CLUB	60.4	12	12.4	64.6	40.2	0.41	77.3	10.4	53.3

* = standard mean nursery flour protein = 10.9 mill used = Quad

SAMPLE#	BREEDER#	MTYPE	COOI	TGS	CAVOL	SCSCOR
0001		3M	8.64	5	1390	81
0002		2M	8.94	6	1340	76
0003						
0004						
0005						
0006						
0007		3M	8.52	5	1305	73
0008		1M	9.00	7	1360	79
0009		3M	8.84	6	1255	71
0010		2M	8.88	7	1260	73
0011						
0012						
0013		3M	8.94	6	1310	75
0014		2M	9.33	8	1335	78

* = standard mean nursery flour protein = 10.9 mill used = Quad

COMMENTS: Penawawa and UC657 from Dusty, Lamont and Moses Lake had low test weight (below 55.0 lbs/bu) and were not processed for quality. Sponge cakes of Penawawa and UC657 from Dayton were slightly sunken in the center, which indicated some sprout damage occurred in these lines. Sponge cakes of Penawawa and UC657 from Farmington were moderately sunken in the center, which indicated fairly heavy sprout damage had occurred in these lines.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UMHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0001	ID377S	9201	HWS	61.5	77	13.3	65.5	9.9	0.42	72.2	12.2	63.8
0002	KLASIC 1	9202	HWS	60.1	55	13.5	69.2	10.6	0.44	76.6	12.6	65.3
0003	OR487279	9203	HWS	63.7	75	12.9	72.2	11.9	0.38	85.3	12.1	64.2
0004	ID377M	9204	HWS	61.1	81	13.3	68.0	8.8	0.45	74.9	12.2	63.8
0005	ID377I	9205	HWS	60.8	80	13.4	66.9	8.7	0.46	74.2	12.1	64.1
0006	ID355	9206	HWS	62.6	97	12.4	68.2	10.6	0.40	78.6	11.5	63.7
0007	KLASIC 2	9207	HWS	62.9	83	12.6	72.3	9.9	0.33	86.6	12.0	64.7
0008	KLASIC 3	9208	HWS	62.6	60	12.0	70.6	10.0	0.35	81.5	11.6	62.3
0009	OR850513	9209	HWS	65.3	88	9.9	71.9	11.7	0.37	84.9	9.4	59.7
0010	WA7679	9210	HWS	60.8	76	10.2	70.2	11.8	0.37	82.1	9.5	60.6
0011	FEDERATION	9211	SHS	61.5	30	10.9	69.7	15.0	0.37	79.5	9.4	56.4
0012	KLASIC 4 HI-PRO	9212	HWS	60.1	63	13.6	69.6	11.3	0.34	81.0	12.9	63.4
0013	ORS8413	9213	HWS	63.3	76	11.4	70.7	10.4	0.36	83.5	10.6	63.6

mill used = Buhler

SAMPLE#	BREEDER#	MTYPE	BABS	MTIME	LVOL	BCRGR	PROQ	RVA	COLOR
0001	9201	5H	65.0	4.1	945	4	0	253	Q
0002	9202	6H	67.5	5.3	1050	4	+1	259	Q
0003	9203	4H	66.4	4.1	1030	3	+1	250	Q
0004	9204	4H	67.0	3.6	975	4	+1	242	Q
0005	9205	4H	66.3	4.4	950	5	0	247	S
0006	9206	3H	67.4	3.1	890	6	0	137	S
0007	9207	6H	67.9	5.3	1045	4	+1	213	Q
0008	9208	6H	64.5	6.1	995	5	+1	252	Q
0009	9209	5M	63.9	3.3	805	7	+1	170	S
0010	9210	7M	63.8	4.0	825	7	+1	146	S
0011	9211	2M	56.6	1.0	695	7	-1	141	U
0012	9212	6H	65.6	6.1	1070	4	+1	239	Q
0013	9213	5H	66.8	4.0	885	6	+1	167	S

mill used = Buhler

COMMENTS: In 1992, the Western Wheat Quality Laboratory and the U.S. Wheat Associates cooperatively established a program for the overseas evaluation of promising hard white breeding lines. This collaborative program is to provide feedback on the strengths and weaknesses of individual breeding lines, as well as specific methodology and other information for noodle evaluation and guidelines for assessing flour performance. Lines were submitted by breeders after solicitation for entries. The origin of wheat used in making up of composites for the selections in this nursery are listed below (see the following nurseries for this information).

<u>Nursery</u>	<u>Nursery Identification</u>	<u>Location</u>	<u>Breeder</u>
082	Hard White Overseas Testing	various-WA	C.F. Konzak
083	Hard White Overseas Testing	Aberdeen, ID	E. Souza
084	Hard White Overseas Testing	various-OR	W.E. Kronstad
085	Hard White Overseas Testing	various-WA	B. Miller
086	Hard White Overseas Testing	various-WA	C.F. Konzak
122	Hard White Overseas Testing	various-WA	E. Donaldson

An extensive collaborative analysis report entitled "1992 Overseas Collaborative Quality Analysis of Hard White Wheat Varieties for Production of Asian Noodles" was prepared by U.S. Wheat Associates, Portland, OR. Another report entitled, "Report on the 1992-Crop Hard White Collaborative Testing Program" was prepared July 1993, by Dr. Craig F. Morris, Director of the USDA-ARS Western Wheat Quality Laboratory. This report by Dr. Morris summarizes the evaluation and findings of these hard white varieties and/or breeding lines as reported by U.S. Wheat Associates. Bread was baked on all lines. Rapid Visco Analyzer (RVA) viscosity was determined on all lines. RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph Viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable. Alkaline flour color (COLOR) was scored on all lines. Color represents an extremely important quality criterion in Asian types of noodles. A preliminary alkaline flour color test was initiated. An alkaline Pekar slick was used to subjectively measure flour color. The Pekar slick was prepared by pressing flour to a smooth surface, immersing in a 1.0% alkaline solution consisting of 60% K₂CO₃ and 40% Na₂CO₃ for 2 minutes. The sample rested at a room temperature of (77°F) for 4 hours before visual observation and scoring. Flours were scored by the following; S = satisfactory, q = questionable, and U = unsatisfactory. Desirable flour color ranges from bright white through creamy yellow to bright yellow. Any dullness, brown, or greenish casts would be unacceptable. Alkaline flour color (COLOR) is scored only on SHW, HWW, SWS and HWS wheats which have a minimum RVA viscosity of 150 and a minimum NIR wheat hardness (UWHRD) value of 40.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0001	N8202608/N8104601	WA007681	HRW	61.5 -	74	12.3	58.4 -2	22.4	0.36	74.6 -	10.6	58.2
0002	BATUM/KVZoc//ID3518	WA007719	HRW	59.8 -2	73	12.6	61.9	23.1	0.40 -	76.1	9.7	55.3 -
0003	N82060/N8201707	WA007720	HRW	60.1 -2	74	12.4	64.1 +2	26.3	0.36	80.5 +	10.7	57.3
0004	P1512281/ID735103//OR792	WA007721	HRW	62.1	81	12.3	61.5	23.6	0.35	78.3	10.5	56.8
0005	UT125327/N821613	WA007722	HRW	62.0 -	80	12.4	60.2	23.4	0.36	76.5	10.2	59.5
0006	N82076//K710255/K711537	WA007723	HRW	61.8 -	83	11.5	62.1	22.3	0.37	77.9	9.8	57.5
0007	KARCAGIm/9342//HTN	WA007724	HRW	60.9 -	81	11.7	56.9 -2	21.3	0.40 -	70.9 -2	9.4	57.8
0008	KARCAGIm/9342//N8201102	WA007725	HRW	60.5 -	74	11.7	57.6 -2	22.3	0.37	73.2 -2	9.3	58.3
0009	P1512281 RESELECTION	WA007726	HRW	59.5 -2	69	12.8	60.5	25.1	0.42 -2	73.6 -	10.8	59.8
0010	P1512281 RESELECTION	WA007727	HRW	59.6 -2	59	13.0	61.3	24.9	0.41 -2	75.0 -	10.5	58.4
0011	P1512281 RESELECTION	WA007728	HRW	58.8 -2	65	12.7	60.7	25.4	0.40 -	74.9 -	10.8	58.3
*0012	HATTON	C1017772	HRW	63.7	78	12.3	61.1	26.0	0.36	77.4	10.3	58.4
0013	BATUM	P1495013	HRW	59.1 -2	73	11.7	60.9	22.4	0.38	76.1	9.5	56.5
0014	P1512281 RESELECTION	WA026817	HRW	58.9 -2	52	12.8	60.2	24.5	0.38	75.4	10.4	58.0
0015	P1512281 RESELECTION	WA036817	HRW	59.4 -2	60	12.6	60.6	25.1	0.36	76.9	10.6	57.5
0016	P1512281 RESELECTION	WA326817	HRW	59.5 -2	66	13.0	59.7 -	25.3	0.36	75.9	10.7	57.8
0017	P1512281 RESELECTION	WA346817	HRW	58.8 -2	40	13.6	60.8	26.4	0.38	76.0	10.9	57.5
0018	P1512281 RESELECTION	WA536817	HRW	57.8 -2	57	13.4	60.8	25.8	0.37	76.6	10.9	57.8
0019	P1512281 RESELECTION	WA586817	HRW	57.9 -2	58	13.4	60.0	25.7	0.39 -	74.7 -	11.0	57.3
0020	P1512281 RESELECTION	WA626817	HRW	58.5 -2	59	12.6	60.8	25.5	0.42 -2	73.9 -	10.5	57.3
0021	P1512281 RESELECTION	WA636817	HRW	59.6 -2	64	13.0	60.9	25.4	0.38	76.1	10.7	57.3
0022	P1512281 RESELECTION	WA696817	HRW	59.6 -2	54	13.0	60.2	25.0	0.38	75.4	10.5	57.4

* = standard mean nursery flour protein = 10.4 mill used = Quad

Standard Mean

Nursery Mean

Nursery Standard deviation

Standard Mean

Nursery Mean

Nursery Standard deviation

HRW	63.7	78	12.3	61.1	26.0	0.36	77.4	10.3	58.4
HRW	59.9	66	12.7	60.8	24.7	0.38	76.1	10.5	57.7
HRW	1.54	11.2	0.53	1.11	1.33	0.021	1.61	0.41	0.98
HRW	63.7	78	12.3	61.1	26.0	0.36	77.4	10.3	58.4
HRW	60.7	78	11.7	57.2	21.8	0.38	72.1	9.3	58.0
HRW	0.28	4.9	0.00	0.49	0.71	0.021	1.63	0.07	0.35

SAMPLE#	BREEDER#	MTYPE	BABS	MTIME	LVOL	BCRGR	PROQ	RVA	COLOR*
0001	WA007681	6M	61.4	3.6	815 -	6	0		
0002	WA007719	6H	59.5 -	5.8 +	845	7	+1		
0003	WA007720	5H	60.5	4.0	885	5	+1		
0004	WA007721	8M	61.0	5.3 +	875	7	+1		
0005	WA007722	6H	62.7	5.7 +	845	8	+1		
0006	WA007723	3H	62.7	3.6	830 -	6	+1		
0007	WA007724	8M	60.0 -	6.1 +2	765 -2	9	0	207	U
0008	WA007725	5H	63.5	4.8 +	760 -2	9	0	205	U
0009	WA007726	4H	63.5	3.9	950 +	6	+1		
0010	WA007727	5M	62.6	4.1	900	5	+1		
0011	WA007728	4H	62.5	3.7	890	5	+1		
*0012	C1017772	3H	62.6	3.3	875	4	+1		
0013	P1495013	2H	60.7	2.5	800 -	8	+1		
0014	WA026817	6M	63.2	4.4	825 -	5	0		
0015	WA036817	5H	61.7	3.9	855	6	+1		
0016	WA326817	4H	62.0	3.4	890	5	+1		
0017	WA346817	4H	62.7	3.7	895	5	+1		
0018	WA536817	5H	62.0	3.7	920 +	6	+1		
0019	WA586817	5H	61.5	3.6	950 +	5	+1		
0020	WA626817	4H	61.5	3.5	895	4	+1		
0021	WA636817	5H	60.5	4.5	905	4	+1		
0022	WA696817	5H	59.6 -	5.3 +	870	6	+1		

* = standard mean nursery flour protein = 10.4 mill used = Quad

HRW	62.6	3.3	875	4
HRW	61.7	4.1	876	6
HRW	1.14	0.86	41.1	1.2
HRW	62.6	3.3	875	4
HWW	61.8	5.4	762	9
HWW	2.47	0.92	3.5	0.0
			206	
			1.4	

COMMENTS: Quality parameters of HRW and HWW lines in this nursery were graded by comparison to the standard mean of Hatton. Breeder # WA346817 had NIR wheat hardness value of 40 and would be considered unacceptable being classified as HRW. All other lines in the nursery had NIR wheat hardness value above 50 and were classified as HRW or HWW. Most lines had flour yield and milling score comparable to the standard mean. Bread was baked on all lines. Bread loaf volume of all lines was equal to or significantly higher than that expected for their flour protein content as graded by their Protein Quality (PROQ) rating. The mean nursery flour protein content was 10.4%. At this level, one should expect loaf volume to be near 815 cc if the protein is of good quality. Most lines had bread crumb grain score judged to be less than that of Hatton. Rapid Visco Analyzer (RVA) viscosity was determined on the HWW lines. RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable. Alkaline flour color (COLOR) was scored on the HWW lines. *Color represents an extremely important quality criterion in Asian types of noodles. A preliminary alkaline flour color test was initiated. An alkaline Pekar slick was used to subjectively measure flour color. The Pekar slick was prepared by pressing flour to a smooth surface, immersing in a 1.0% alkaline solution consisting of 60% K₂CO₃ and 40% Na₂CO₃ for 2 minutes. The sample rested at a room temperature of (77°F) for 4 hours before visual observation and scoring. Flours were scored by the following: S = satisfactory, Q = questionable, and U = unsatisfactory. Desirable flour color ranges from bright white through creamy yellow to bright yellow. Any dullness, brown, or greenish casts would be unacceptable. Alkaline flour color (COLOR) is scored only on SWW, HWW, SWS and HWS wheats which have a minimum RVA viscosity of 150 and a minimum NIR wheat hardness (UWHRD) value of 40.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0001	WA6911/N820804//N8201605	N9203201	HRW	56.1	62	15.5	61.5 -	31.3	0.33	79.4 -	13.7	62.7 +
0002	WA6911/N820804//N8201605	N9203202	HRW	55.7 -	54	14.5	63.6	32.7	0.29 +	83.7	13.2	61.5 +
0003	WA6911/N820804//N8201605	D9203203	HWW	57.6	58	14.1	64.2	31.6	0.32	82.7	12.0	59.7
0004	WA6911/N820804//N8201605	N9203204	HRW	56.4	71	15.8 +	65.4 +	34.8	0.31	84.5 +	14.0 +	61.3 +
0005	N8302702/N8304802	N9203001	HRW	56.9	79	15.6	62.6	30.6	0.32	81.1	13.9	61.3 +
*0006	HATTON 1	C1017772	HRW	57.9	61	14.6	62.9	31.3	0.30	82.4	12.8	58.2
0007	HILL 81/SXW321//WA7171	N9203101	SWW		45	14.2						
0008	ID 280/JOHN	N9203109	HRW	56.8	58	15.5	61.9 -	30.9	0.30 +	81.4	13.8	58.4
0009	ID 280/JOHN	N9201101	HRW	56.3	61	16.0 +	60.8 -2	29.4	0.25 +2	82.8	13.9	61.4 +
0010	ID 280/JOHN	N9201102	HRW	57.1	57	16.0 +	63.5	31.3	0.27 +2	84.6 +	13.9	60.9
*0011	HATTON 2	C1017772	HRW	57.6	67	14.4	63.3	32.3	0.29	83.3	12.6	58.8
0012	ID 280/JOHN	N9201103	HRW	56.4	66	14.6	63.5	29.2	0.28 +2	84.1 +	13.1	61.4 +
0013	ID 280/JOHN	N9201104	HRW	56.8	59	14.8	63.8	30.3	0.33	81.8	12.8	59.8
0014	ID 280/JOHN	N9201105	HRW	57.2	55	14.4	64.9 +	31.8	0.35 -	81.9	12.7	61.5 +
0015	ID 280/JOHN	D9201106	HWW	57.1	68	14.7	62.4	32.7	0.30 +	81.9	13.2	61.4 +
0016	ID 280/JOHN	D9201107	HWW	56.9	58	15.0	65.0 +	30.9	0.33	83.0	13.2	61.4 +
0017	ID 280/JOHN	N9201108	HRW	56.6	67	14.3	63.6	33.6	0.31	82.6	12.5	60.8
0018	N8200503/N8406201	N9202301	HRW	55.6 -	57	15.2	63.5	31.5	0.31	82.5	13.3	61.7 +
0019	C82-22/BATUM	N9200601	HRW	55.5 -	53	16.0 +	63.5	32.4	0.31	82.5	13.9	62.9 +
0020	C82-22/BATUM	N9200604	HRW	55.7 -	54	15.1	63.4	29.7	0.32	81.9	13.5	62.2 +
0021	WA6365/TX69A450-1//ID281	N9202801	HRW	56.7	56	16.0 +	62.3	29.0	0.32	80.7	14.3 +	60.0
*0022	HATTON 3	C1017772	HRW	57.8	69	14.4	63.3	32.1	0.33	81.3	12.6	58.0
0023	LR B/HTN	N9201702	SRW		34	14.6						
0024	N8200932/N8406201	N9202701	HRW	56.1	55	15.9 +	64.7 +	32.2	0.33	82.7	14.3 +	62.2 +
0025	N8200932/N8406201	N9202702	HRW	55.8 -	56	15.5	64.2	31.2	0.33	82.2	14.2 +	61.2 +
0026	N8200932/N8406201	N9202703	SRW		48	15.0						
0027	C82-11/HTN	N9200804	HRW	57.2	58	14.3	63.4	32.9	0.32	81.9	13.0	56.5
0028	C82-11/HTN	N9200805	HRW	56.8	62	14.1	63.2	33.1	0.32	81.7	12.8	55.4 -
0029	C82-11/HTN	N9200803	HRW	57.2	52	14.1	63.5	33.3	0.32	82.0	12.7	54.5 -
0030	DUSTY/N830905//WA7173	N9203301	HRW	55.7 -	65	14.4	62.3	27.8	0.36 -	78.6 -	12.4	58.2
0031	N8200602/N8202503	N9202501	HRW	55.2 -	74	16.1 +	63.4	30.5	0.31	82.4	14.0 +	61.1 +
*0032	HATTON 4	C1017772	HRW	57.8	61	14.4	63.0	32.6	0.33	80.9	12.5	58.4
0033	WA6817/ID281//N8402302	N9204801	HRW	55.9	64	14.8	64.4	32.2	0.30 +	84.0 +	13.1	60.4
0034	WA6817/ID281//N8402302	N9204803	HRW	55.8 -	61	14.3	62.9	33.0	0.30 +	82.4	12.6	59.5
0035	N8200932/N8302703	D9202602	HWW	55.4 -	70	15.4	64.8 +		0.29 +	84.9 +	13.5	60.4
0036	N8200932/N8302703	N9202601	HRW	55.5 -	71	15.8 +	64.5 +	31.3	0.29 +	84.6 +	14.1 +	60.7
0037	D86077/N86048	N9206101	SRW		46	16.0 +						
*0038	HATTON 5	C1017772	HRW	57.3	66	14.3	63.5	32.7	0.30	83.0	12.9	59.7
0039	BUCHANAN 1-5	P1532994	HRW	52.8 -2	57	15.1	64.2	32.1	0.29 +	84.3 +	13.0	59.2
0040	N8200602/N8202503	N9202502	HRW	55.5 -	63	15.7	63.9	30.7	0.29 +	84.0 +	13.7	60.4

* = standard mean nursery flour protein = 13.3 mill used = Quad

SAMPLE#	BREEDER#	MTYPE	BABS	MTIME	LVOL	BCRGR	PROQ	RVA	COLOR*
0001	N9203201	3H	65.9 +	3.4	1075 +2	2	+1		
0002	N9203202	2H	63.7	2.5	1085 +2	3	+1		
0003	D9203203	4H	61.9	3.9 +	985	4	+1	124	
0004	N9203204	1H							
0005	N92033001	1H							
*0006	C1017772	2H	70.4	2.5	1055	4	+1		
0007	N9203101								
0008	N9201109	2H							
0009	N9201101	1H							
0010	N9201102	2H							
*0011	C1017772	2H	61.0	2.2	975	5	0	113	
0012	N9201103	2H	65.1 +	2.8	1040 +	4	+1		
0013	N9201104	2H	62.0	2.0	980	5	0		
0014	N9201105	2H	65.7 +	2.5	1035 +	4	+1		
0015	D9201106	2H						113	
0016	D9201107	2H						113	
0017	N9201108	2H	64.0	2.4	995	4	+1		
0018	N9202301	2H							
0019	N9200601	2H	66.1 +	2.5	1065 +2	4	0		
0020	N9200604	2H	65.9 +	2.0	1080 +2	4	+1		
0021	N9202801	2H	63.7	2.2	1060 +2	3	0		
*0022	C1017772	2H	61.7	1.9	965	5	0		
0023	N9201702								
0024	N9202701	2H	65.9 +	2.8	1060 +2	4	0		
0025	N9202702	2H	64.9	2.0	1045 +	3	0		
0026	N9202703								
0027	N9200804	3M	58.7 -	2.1	780 -2	6	-1		
0028	N9200805	3M	59.1 -	1.9	830 -2	8	-1		
0029	N9200803	2H							
0030	N9203301	2H	62.9	1.9	965	4	0		
0031	N9202501	1H							
*0032	C1017772	2H	63.1	2.3	935	4	0		
0033	N9204801	2H	64.1	2.5	1075 +2	2	+1		
0034	N9204803	2H	61.7	2.2	990	3	+1		
0035	D9202602	2H	62.6	2.4	1085 +2	4	+1	65	
0036	N9202601								
0037	N9206101	2H							
*0038	C1017772	2H	61.9	2.4	1010	4	+1		
0039	P1532994	2H	61.4	1.8	885 -2	5	-1		
0040	N9202502	2H							

* = standard mean nursery flour protein = 13.3 mill used = Quad

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0041	N8200602/N8202503	N9202503	HRW	55.9	68	15.5	63.8	31.3	0.31	82.8	13.8	60.2
0042	N8200602/N8202503	N9202505	HRW	55.9	72	15.2	64.2	30.4	0.30 +	83.8 +	13.8	60.3
0043	N8200602/N8202503	N9202506	HRW	55.2 -	73	16.1 +	63.7	30.3	0.32	82.2	14.3 +	60.3
0044	C82-22/HTN	D9201002	HWW	56.5	61	14.5	63.9	32.1	0.33	81.9	13.2	61.2 +
0045	DUSTY/N830905//WA7173	N9203302	HRW	55.1 -	61	14.7	60.9 -2	28.9	0.36 -	77.2 -2	12.4	59.4
0046	DUSTY/N830905//WA7173	N9203303	HRW	57.8	64	15.0	57.2 -2	26.1	0.35 -	73.8 -2	12.8	58.5
0047	N8200101/N8302701	N9202203	HRW	55.8 -	68	15.7	63.6	30.3	0.31	82.6	14.2 +	60.3
0048	N8200101/N8200602	N9202103	HRW	57.5	65	14.9	63.9	31.6	0.30 +	83.5	13.0	60.4
0049	N8200101/N8200602	N9202105	HRW	56.0	60	15.0	62.8	28.3	0.34	80.2	13.1	59.3
0050	N8200101/N8200602	N9202101	HRW	57.8	60	15.4	62.0 -	30.2	0.30 +	81.5	13.3	59.2
0051	LR B/HTN	N9201701	SRW		49	14.4						
*0052	HATTON 6	C1017772	HRW	57.4	59	14.3	63.6	31.6	0.33	81.6	12.4	58.4
0053	NLY/LJN//N7301004/CER	N9205802	HRW	54.5 -	57	16.1 +	59.7 -2	29.5	0.31	78.5 -	13.8	58.3
0054	WA7270//WA7166//MNG	N9206301	SRW		47	16.0 +						
0055	ID284//WA7217//CER/HTN SI	D9205901	HWW	57.3	51	14.8	61.5 -	28.2	0.31	80.4	13.2	61.8 +
0056	LR 3bg/HTN	N9201501	HRW	56.4	67	15.6	60.8 -2	28.4	0.34	78.1 -	13.7	59.3
*0057	HATTON 7	C1017772	HRW	57.3	64	14.3	63.1	31.1	0.34	80.5	12.6	59.3
0058	77367//FR20//N741612//PAHA	N9204901	SRW		47	15.2						
0059	C0696317//CER//WTN	N9201803	HRW	57.1	65	15.1	62.7	30.2	0.30 +	82.2	13.3	60.9
0060	C0696317//CER//WTN	N9201804	HRW	58.0	64	15.6	65.1 +	33.0	0.31	84.2 +	13.7	60.9
0061	C82-8/HTN	N9200707	SRW		47	15.2						
0062	C82006//WA56910//WA7429	N9205603	HWW	57.0	54	14.4	61.5 -	29.6	0.31	80.4	12.7	55.3 -
0063	KVZ/17271//N743803//ID114	N9204301	HRW	56.9	58	14.7	61.2 -	30.7	0.33	79.1 -	12.5	57.4
0064	WAA6817//NSR//N8401201	N9204703	HRW	55.4 -	53	16.2 +	63.4	33.2	0.28 +2	84.0 +	14.4 +	61.6 +
*0065	HATTON 8	C1017772	HRW	57.4	65	14.1	63.3	32.4	0.31	82.3	12.3	57.4
0066	WA6817//C11442//N8400801	N9204501	SRW		48	14.8						
0067	WA7171//WA7163//KVZ/17271	N9206003	SRW		43	14.4						
0068	WA7171//WA7163//KVZ/17271	N9206005	SRW		37	15.5						
0069	WA7171//WA7163//KVZ/17271	N9206002	SRW		45	15.0						
0070	D86015//N86117	N9205303	HRW	56.5	62	16.4 +	60.6 -2	30.1	0.29 +	80.5	14.5 +	61.6 +
0071	WA6817//C11442//N85085	N9204601	SRW		41	15.0						
0072	C82-21//HTN//OMARM/192387	N9205703	SRW		45	14.5						
0073	77-367//FR-50//BATUM rogu	N9205104	HRW	55.2 -	67	14.8	65.6 +2	31.9	0.33	83.7	13.6	59.2
0074	77-367//FR-50//BATUM rogu	N9205103	SRW		42	14.6						
0075	ORCR8107//BATUM//N8200602	N9203601	HRW	54.7 -	57	15.1	63.2	24.0	0.36 -	79.6	13.2	61.3 +
*0076	HATTON 9	C1017772	HRW	57.5	63	14.2	63.2	30.3	0.35	80.1	12.5	57.7
0077	WA76910//N831802//N856302	N9205502	HRW	56.4	56	16.2 +	59.8 -2	27.2	0.34	77.1 -2	14.1 +	60.1
0078	WA76910//N831802//N856302	N9205501	HRW	55.2 -	54	15.1	60.7 -2	28.1	0.30 +	80.1	13.1	59.3
0079	CER/HTN s//N8400901	N9204202	HRW	55.9	58	15.5	60.2 -2	30.3	0.37 -2	75.9 -2	13.1	58.2
0080	N8200602/HTN	N9202401	HWW	56.5	65	14.5	65.1 +	28.4	0.35 -	82.1	12.6	

* = standard mean nursery flour protein = 13.3 mill used = Quad

SAMPLE#	BREEDER#	MTYPE	BABS	MTIME	LVOL	BCRGR	PROQ	RVA	COLOR*
0041	N9202503	2H							
0042	N9202505	2H	62.5	1.9	1010 +	4	-1		
0043	N9202506	2H	62.5	1.9	1005	4	-1		
0044	D9201002	3H	64.4	3.2	1090 +2	3	+1	179	S
0045	N9203302	2H	63.1	2.2	970	5	0		
0046	N9203303	3H	63.2	2.2	1025 +	6	+1		
0047	N9202203	2H							
0048	N9202103	2H	64.1	2.1	1090 +2	3	+1		
0049	N9202105	2H	63.0	2.2	995	5	0		
0050	N9202101	2H							
0051	N9201701								
*0052	C1017772	2H	62.1	2.0	985	4	+1		
0053	N9205802	1H							
0054	N9206301								
0055	D9205901	4H	65.5 +	4.4 +	1075 +2	2	+1	174	U
0056	N9201501	2H	63.0	2.0	1040 +	2	0		
*0057	C1017772	2H	63.0	2.1	950	4	0		
0058	N9204901								
0059	N9201803	3H	64.6	3.0	1020 +	3	0		
0060	N9201804	1H							
0061	N9200707								
0062	N9205603	1H							
0063	N9204301	2H	61.1	2.3	910 -	6	-1	102	
0064	N9204703	2H	65.3 +	2.5	1150 +2	3	+1		
*0065	C1017772	2H	61.1	1.9	935	5	0		
0066	N9204501								
0067	N9206003								
0068	N9206005								
0069	N9206002								
0070	N9205303	3H	65.3 +	2.3	1015 +	3	-1		
0071	N9204601								
0072	N9205703								
0073	N9205104	1H							
0074	N9205103								
0075	N9203601	3H	65.0 +	3.9 +	1060 +2	2	+1		
*0076	C1017772	2H	61.4	2.0	945	5	0		
0077	N9205502	1H							
0078	N9205501	2H	63.0	1.9	1040 +	4	+1		
0079	N9204202	2H	61.9	2.2	940	5	-1		
0080	N9202401							110	

* = standard mean nursery flour protein = 13.3 mill used = Quad

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWNRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0081	N8200602/HTN	N9202402	HRW	55.7 -	66	16.6 +	61.6 -	29.6	0.34	79.0 -	14.5 +	60.3
0082	N8200602/HTN	N9202403	HRW	56.3	67	16.0 +	64.7 +	28.7	0.33	82.7	13.9	61.4 +
*0083	HATTON 10	C1017772	HRW	57.9	66	13.5	64.4	31.7	0.35	81.4	12.1	57.5
0084	BUCHANAN 6-10	P1532994	HRW	52.2 -2	59	14.9	63.8	31.4	0.34	81.3	12.8	
* = standard mean nursery flour protein = 13.3 mill used = Quad												
Standard Mean			HRW	57.6	64	14.3	63.4	31.8	0.32	81.7	12.5	58.3
Nursery Mean			HRW	56.3	62	15.1	63.0	30.8	0.32	81.6	13.3	59.8
Nursery Standard deviation			HRW	1.15	5.9	0.73	1.55	1.91	0.024	2.22	0.66	1.72
Standard Mean			HRW	57.6	64	14.3	63.4	31.8	0.32	81.7	12.5	58.3
Nursery Mean			HW	56.8	61	14.7	63.5	30.5	0.32	82.2	12.9	60.2
Nursery Standard deviation			HW	0.67	6.7	0.40	1.53	1.79	0.019	1.46	0.48	2.26
Standard Mean			HRW	57.6	64	14.3	63.4	31.8	0.32	81.7	12.5	58.3
Nursery Mean			SW		45	14.2						
Nursery Standard deviation			SW									
Standard Mean			HRW	57.6	64	14.3	63.4	31.8	0.32	81.7	12.5	58.3
Nursery Mean			SRW		44	15.0						
Nursery Standard deviation			SRW		4.4	0.53						

SAMPLE#	BREEDER#	MTYPE	BABS	MTIME	LVOL	BCRGR	PROQ	RVA	COLOR*
0081	N9202402	2H							
0082	N9202403	2H	65.1 +	1.9	1000	5	-1		
*0083	C1017772	2H	61.2	2.2	930	5	0		
0084	P1532994								
* = standard mean nursery flour protein = 13.3 mill used = Quad									
HRW			62.7	2.2	968	4			
HRW			63.3	2.3	1000	4			
HRW			2.14	0.42	71.4	1.2			
HRW			62.7	2.2	968	4			
HRW			63.6	3.5	1059	3		122	
HRW			1.65	0.87	49.6	1.0		37.6	
HRW			62.7	2.2	968	4			
HRW			62.7	2.2	968	4			

COMMENTS: Quality parameters of HRW and HWW selections in this nursery were compared by comparison to the standard mean of Hatton. All selections were initially screened for adequate NIR wheat hardness and protein content. Fifteen selections had NIR wheat hardness value less than 50 and were classified as SRW or SHW. These selections were excluded from further testing. Those selections which survived the initial screening were milled. The mean nursery test weight was near 56.5 lbs/bu. This contributed somewhat to lower flour yield and/or milling score. Flour yield and/or milling score of most selections was comparable to that of Hatton. The mean nursery wheat protein content was near 15.0% and the mean nursery flour protein was 13.3%. Most selections, including Hatton had very short dough mixing time as exhibited by their mixograms. Most were typed as 2H, with only a few being 3-4H. Hatton is considered too short in mixing time. Desirable dough mixing time for bread type wheats should be a minimum of three minutes; however, the most desirable mixing time is around 4-5 minutes. Only those selections which had mixogram type properties near Hatton or better were bread-baked. Most selections had lower than expected water absorption as determined by mixogram absorption (MABS) and baking absorption (BABS) for their flour protein content. Loaf volume of most selections was equal to or significantly higher than that expected for their flour protein content as graded by their protein quality (PROQ) rating. The mean nursery flour protein content was 13.3% and at this level one should expect a loaf volume near 1000 cc if the protein is of good quality. Bread crumb grain score of several selections was judged to be equal to or significantly better than that of Hatton. Flour of Sample #'s 920080 and 920084 were lost due to inadvertent mixture caused by breakage of their respective jars. Rapid Visco Analyzer (RVA) viscosity was determined on all HWW lines. RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable.

Alkaline flour color (COLOR) was scored on those HWW lines which had a RVA viscosity of 150 and higher. *Color represents an extremely important quality criterion in Asian types of noodles. A preliminary alkaline flour color test was initiated. An alkaline pekar slick was used to subjectively measure flour color. The Pekar slick was prepared by pressing flour to a smooth surface, immersing in a 1.0% alkaline solution consisting of 60% K_2CO_3 and 40% Na_2CO_3 for 2 minutes. The sample rested at a room temperature of (77°F) for 4 hours before visual observation and scoring. Flours were scored by the following: S = satisfactory, Q = questionable, and U = unsatisfactory. Desirable flour color ranges from bright white through creamy yellow to bright yellow. Any dullness, brown, or greenish casts would be unacceptable. Alkaline flour color (COLOR) is scored only on SWW, HWW, SWS and HWS wheats which have a minimum RVA viscosity of 150 and a minimum NIR wheat hardness (UWHRD) value of 40.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UMHRD	WPROT	FYIELD	BFYIELD	FASH	MSCOR	FPROT	MABS
0001	WA6817/1D281//N8402302	D9204802	SWW	58.1	12	13.8 +	61.6 -2	37.1	0.31	79.8 -	11.3	58.0
0002	WA76910/N831802//N856302	N9205503	HRW	56.8 -	56	14.0 +	60.0 -2	28.8	0.34 -	77.3 -2	12.1 +	59.5 +
0003	WA76910/N831802//N856302	N9205504	HRW	57.3	53	13.9 +	59.6 -2	30.3	0.30	79.0 -2	12.2 +	59.4 +
0004	ELGIN/PI166910//ANDREWS	N9200301	HRW	57.2	53	12.9	62.5 -	33.6	0.27 +	83.6	11.3	58.2
0005	ORCR8107/BATUM//N8200602	N9203602	HRW	57.6	62	13.1	63.8	29.4	0.36 -2	80.2 -	11.5	58.5
0006	CER/HTN s//N8400901	N9204201	HRW		42	12.5						
0007	WA007173/N8200602	N9201903	HRW	56.9 -	57	14.6 +	61.7 -2	31.9	0.28 +	82.2	12.9 +	59.4 +
0008	WA007173/N8200602	N9201905	HRW	57.5	49	14.0 +	62.0 -	29.5	0.30	81.5	12.3 +	60.5 +
0009	WA007173/N8200602	N9201901	HRW	57.1	58	13.8 +	61.1 -2	30.3	0.32	79.5 -	11.9 +	59.7 +
0010	WA007173/N8200602	N9201902	HRW	58.2	56	14.3 +	60.3 -2	31.8	0.30	79.7 -	12.1 +	60.5 +
0011	RDWsel/3/ND/P101//BB/GLL	N9201202	HRW	56.8 -	50	12.9	61.7 -2	31.6	0.34 -	79.1 -	10.7	58.3
0012	RDWsel/3/ND/P101//BB/GLL	N9201201	HRW	58.9	51	13.3	66.2 +	29.7	0.31	85.3	11.6	59.2 +
*0013	HATTON 11	C1017772	HRW	58.5	51	12.9	64.1	33.1	0.29	84.2	11.2	59.5
0014	WA7270/WA7166//MNG	N9206302	HRW	57.8	61	12.6	66.9 +2	34.6	0.30	86.6 +	10.6	60.3 +
0015	WA7270/WA7166//MNG	N9206303	HRW	56.8 -	51	13.4 +	64.7	30.1	0.33 -	82.7	11.6	59.3 +
0016	ID284/WA7217//CER/HTN SI	N9205902	HWW	58.5	45	12.5	61.9 -2	29.4	0.26 +2	83.5	10.7	59.5 +
0017	ID284/WA7217//CER/HTN SI	D9205903	HWW	58.3	35	12.2	61.8 -2	30.0	0.27 +	82.8	10.2	59.3 +
0018	CO696317/CER//WTN	N9201801	HRW	59.8	62	12.8	65.5 +	32.0	0.29	85.6 +	11.5	60.2 +
0019	CO696317/CER//WTN	N9201802	HRW	59.5	65	13.3	64.5	31.4	0.30	84.1	11.7	61.2 +
*0020	HATTON 12	C1017772	HRW	58.8	61	12.2	62.9	33.2	0.31	81.9	10.7	57.8
0021	N8402201/N8402005	N9204001	HRW	57.4	47	13.3	65.1	31.6	0.28 +	85.8 +	11.4	57.4
0022	N8402201/N8402005	N9204002	HRW	56.9 -	51	12.9	63.2	31.4	0.30	82.7	12.5 +	59.4 +
0023	N8402201/N8402005	N9204003	HRW	57.1	53	12.0	66.8 +2	33.8	0.29	87.0 +	10.6	57.4
0024	N8402201/N8402005	N9204004	HRW	57.2	57	13.1	66.3 +	32.8	0.31	85.4 +	11.4	58.4
0025	C82-8/HTN	D9200701	HWW	57.7	43	12.4	58.8 -2	30.3	0.29	78.6 -2	10.4	55.5
0026	C82-8/HTN	D9200702	HWW	58.0	46	12.3	59.0 -2	30.3	0.26 +2	80.4 -	10.1	55.5
0027	C82-8/HTN	N9200703	HRW	57.5	56	12.7	61.4 -2	28.3	0.29	81.4	11.4	55.5
0028	C82-8/HTN	D9200705	HWW	58.0	56	12.4	58.5 -2	30.3	0.28 +	78.9 -2	10.8	53.7
*0029	HATTON 13	C1017772	HRW	58.6	57	11.9	64.6	33.5	0.31	83.7	10.5	54.7
0030	C82-8/HTN	N9200706	HRW	58.2	58	13.3	59.6 -2	26.6	0.36 -2	75.8 -2	11.6	53.4 -
0031	C82006/WA56910//WA7429	N9205601	HRW	58.8	46	12.9	63.8	25.8	0.33 -	81.8	11.2	57.3
0032	C82006/WA56910//WA7429	D9205602	HWW	57.9	52	12.9	60.1 -2	30.0	0.32	78.4 -2	11.2	55.4
0033	BFR84012/N86077	N9205011	HRW	56.6 -	54	13.4 +	65.0	32.8	0.31	84.1	11.9 +	58.4
0034	BFR84012/N86077	N9205001	HRW	57.6	47	13.4 +	67.8 +2	32.6	0.29	88.1 +2	11.5	57.4
0035	BFR84012/N86077	N9205002	HRW	56.8 -	46	13.3	65.3 +	33.2	0.30	84.9	11.6	57.5
0036	BFR84012/N86077	N9205003	HRW	58.2	47	13.9 +	65.8 +	32.2	0.31	84.9	11.7	57.4
0037	BFR84012/N86077	N9205004	HRW	57.8	64	12.8	67.4 +2	32.0	0.31	86.6 +	11.3	57.5
0038	BFR84012/N86077	N9205005	HRW	57.9	60	12.6	66.9 +2	31.6	0.30	86.6 +	11.2	57.5
0039	BFR84012/N86077	N9205009	HRW	57.2	58	13.2	64.9	33.1	0.28 +	85.5 +	11.5	59.2 +
0040	BFR84012/N86077	N9205010	HRW	57.8	46	13.5 +	64.6	32.7	0.28 +	85.2	11.7	58.7

* = standard mean nursery flour protein = 11.2 mill used = Quad

SAMPLE#	BREEDER#	MTYPE	COOI	TGS	BABS	MTIME	LVOL	BCRGR	PROQ	RVA	COLOR*
0001	D9204802	1M	9.16	8						132	
0002	N9205503	1H									
0003	N9205504	1H									
0004	N9200301	4M			62.4 +	2.6	895 +	4	0		
0005	N9203602	2H									
0006	N9204201										
0007	N9201903	2H			63.6 +	1.9	965 +2	5	0		
0008	N9201905	2H			64.7 +2	2.0	895 +	5	-1		
0009	N9201901	3M									
0010	N9201902	3H			64.7 +2	2.4	885 +	4	-1		
0011	N9201202	3M									
0012	N9201201	2H			61.4	2.0	905 +2	4	0		
*0013	C1017772	2H			61.7	2.2	870	5	0		
0014	N9206302	5H			62.5 +	5.1 +2	850	5	0		
0015	N9206303	4M			61.0	2.9	840	5	-1		
0016	N9205902	3H	8.27	4	63.2 +	3.0	875 +	5	+1	114	
0017	D9205903	3M	8.30	4	61.5	2.5	835	6	+1	153	q
0018	N9201801	3H			62.4 +	2.3	900 +	4	0		
0019	N9201802	3H			64.4 +2	2.0	910 +2	5	0		
*0020	C1017772	2H			60.0	1.7	815	6	0		
0021	N9204001	3H			61.6	2.5	880 +	4	0		
0022	N9204002	4H			62.6 +	3.2	850	5	-1		
0023	N9204003	4M			59.6	2.6	830	5	0		
0024	N9204004	4H			61.6	3.6 +	860	5	0		
0025	D9200701	1M	8.49	5						93	
0026	D9200702	2M	8.48	5						121	
0027	N9200703	1M									
0028	D9200705	1M	8.35	5						99	
*0029	C1017772	2H			58.9	2.0	800	6	0		
0030	N9200706	1H									
0031	N9205601	5M									
0032	D9205602	1M	8.30	5	60.5	3.2	880 +	6	0		
0033	N9205011	3H			60.6	2.6	885 +	5	-1	151	q
0034	N9205001	3H			60.6	2.3	895 +	6	0		
0035	N9205002	4H			61.7 +	3.1	915 +2	5	0		
0036	N9205003	1H									
0037	N9205004	2H									
0038	N9205005	2H									
0039	N9205009	4H			62.4 +	3.6 +	910 +2	5	0		
0040	N9205010	2H									

* = standard mean nursery flour protein = 11.2 mill used = Quad

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
*0041	HATTON 14	C1017772	HRW	59.0	51	11.8	64.4	33.8	0.31	83.5	10.3	55.7
0042	AE/VPM/MC//HTN	N9203701	HRW	59.0	49	12.4	65.4 +	30.9	0.30	85.0	10.7	55.9
0043	C82-22/BATUM	D9200602	HRW	57.9	47	13.9 +	63.4	29.1	0.29	83.5	12.1 +	57.3
0044	C82-11/HTN	N9200806	HRW	58.3	61	13.7 +	61.9 -2	31.3	0.29	81.9	12.0 +	56.5
0045	C82-11/HTN	N9200801	HRW	57.8	50	13.2	61.7 -2	29.6	0.31	80.6 -	11.5	54.9
0046	C82-11/HTN	N9200802	HRW	57.7	54	13.0	62.1 -	30.6	0.29	82.1	11.3	54.0
*0047	HATTON 15	C1017772	HRW	58.8	53	11.8	63.7	33.5	0.30	83.2	10.3	55.5
0048	BATUM 11-15	P1495013	HRW	56.5 -	43	12.9	67.1 +2	33.3	0.29	87.3 +	10.7	58.4
0049	WA7171/WA7163//KVZ/17271	N9206001	HRW	56.4 -	41	12.2						
0050	LR 23/HTN	N9201601	HRW	56.4 -	50	12.9	63.5	29.7	0.28 +	84.1	11.5	56.1
0051	N8200101/N8200602	N9202102	HRW	58.3	51	13.0	64.1	34.4	0.28 +	84.7	11.7	57.3
*0052	HATTON 16	C1017772	HRW	58.7	63	12.1	65.4	34.4	0.31	84.5	10.8	56.5
0053	WAA6817/NSR//N8401201	N9204701	HRW	57.3	58	13.2	63.0 -	31.3	0.33 -	80.9 -	11.7	56.5
0054	WAA6817/NSR//N8401201	N9204702	HRW	57.2	50	13.7 +	63.6	33.3	0.28 +	84.2	12.0 +	56.1
0055	C82-8/HTN	N9200708	HRW	57.7	46	13.5 +	63.4	30.9	0.33 -	81.4	11.9 +	56.1
0056	D86077/N86048	N9206102	HRW	56.9 -	51	12.5	65.1	31.9	0.32	83.7	10.9	56.2
0057	C82-10/3/AE/VPM/MC	N9200501	HRW	57.5	47	13.0	61.7 -2	31.1	0.29	81.7	11.3	56.3
0058	ID280/WA6817//N85025	N9204401	HRW	57.9	61	13.2	65.4 +	30.2	0.30	85.0	11.5	55.2
0059	D86015/N86117	N9205304	HRW	57.6	53	13.6 +	62.6 -	29.9	0.32	81.1 -	12.0 +	56.7
0060	D86015/N86117	N9205301	HRW	58.3	46	13.2	66.1 +	31.6	0.27 +	87.3 +	11.7	56.8
0061	D86015/N86117	N9205302	HRW	57.3	56	13.8 +	62.0 -	29.0	0.34 -	79.4 -	12.2 +	59.5 +
*0062	HATTON 17	C1017772	HRW	58.3	53	11.4	64.3	34.7	0.31	83.3	10.2	54.9
0063	77367/FR50//01730875/WA7	N9205201	HRW	57.8	47	12.3	68.7 +2	33.3	0.31	87.9 +2	11.5	56.2
0064	WA56910/N848301//ANDREWS	N9205402	HRW	58.3	51	14.3 +	64.9	30.9	0.33 -	82.9	12.7 +	58.0
0065	C82-21/HTN//OMARM/192387	N9205704	HRW	56.7 -	46	13.2	63.2	30.1	0.34 -	80.6 -	11.5	55.5
0066	C82-21/HTN//OMARM/192387	N9205701	HRW	57.5	57	12.7	63.4	30.0	0.34 -	80.8 -	11.4	57.1
0067	C82-21/HTN//OMARM/192387	N9205702	HRW	57.7	45	12.9	63.1	30.0	0.35 -2	80.0 -	11.3	54.8
0068	77-367/FR-50//BATUM rogu	N9205105	HRW		37	13.3						
0069	77-367/FR-50//BATUM rogu	N9205101	HRW		41	12.8						
0070	77-367/FR-50//BATUM rogu	N9205102	HRW		36	12.8						
0071	OR835/N820905//N8201605	N9203504	HRW	57.3	48	12.7	67.3 +2	34.0	0.31	86.5 +	11.3	56.0
0072	OR835/N820905//N8201605	N9203501	HRW	58.3	52	12.4	65.2	34.1	0.32	83.8	10.9	55.1
0073	OR835/N820905//N8201605	N9203502	HRW	58.1	52	12.5	64.0	32.1	0.34 -	81.5	10.7	54.0
0074	OR835/N820905//N8201605	N9203503	HRW	57.2	47	12.3	64.6	31.9	0.30	84.2	10.9	54.8
*0075	HATTON 18	C1017772	HRW	59.0	54	11.6	64.1	33.7	0.33	82.1	10.3	54.7
0076	DUSTY/PI192387	N9200202	HRW	58.4	49	12.9	62.9 -	29.2	0.35 -2	79.8 -	11.3	53.5
0077	DUSTY/PI192387	N9200201	HRW	58.0	58	13.3	65.7 +	31.0	0.35 -2	82.7	11.9 +	54.7
*0078	HATTON 19	C1017772	HRW	58.7	54	11.7	64.4	33.2	0.33	82.4	10.5	56.2
0079	POPE 1/N8203005	N9202005	HRW	58.3	55	12.8	62.0 -	28.1	0.36 -2	78.3 -2	11.6	57.1
0080	POPE 1/N8203005	N9202003	HRW		38	11.7						

* = standard mean nursery flour protein = 11.2 mill used = Quad

SAMPLE#	BREEDER#	MTYPE	CODI	TGS	BABS	MTIME	LVOL	BCRGR	PROQ	RVA	COLOR*
*0041	C1017772	2H			58.9	2.0	830	6	0		
0042	N9203701	3M									
0043	D9200602	2H	8.00	6	60.5	1.9	855	8	-1	153	U
0044	N9200806	2M									
0045	N9200801	1M									
0046	N9200802	1M									
*0047	C1017772	2H			58.7	2.2	800	6	0		
0048	P1495013	2H			61.6	1.7	865 +	6	+1		
0049	N9206001										
0050	N9201601	3H			60.3	2.8	815	5	-1		
0051	N9202102	2H			60.5	2.0	860	6	-1		
*0052	C1017772	2H			59.7	2.1	815	5	-1		
0053	N9204701	2H	8.30	4	59.7	2.0	925 +2	3	0	67	
0054	N9204702	2H			60.3	2.4	875 +	5	-1		
0055	N9200708	6M			60.3	3.9 +	865 +	6	-1		
0056	N9206102	2M									
0057	N9200501	6M			60.5	3.2	850	5	0		
0058	N9204401	3H			59.9	3.0	835	5	-1		
0059	N9205304	2H			62.9 +	2.2	865 +	4	-1		
0060	N9205301	2H			60.0	2.4	915 +2	4	0		
0061	N9205302	3H			63.7 +	2.8	905 +2	3	-1		
*0062	C1017772	3M			57.1	2.4	850	3	+1		
0063	N9205201	2H			58.4	2.0	910 +2	4	0		
0064	N9205402	2M			60.2	2.0	855	6	-1		
0065	N9205704	2H			57.7	2.4	945 +2	4	+1		
0066	N9205701	2H			60.3	2.6	870 +	5	0		
0067	N9205702	2H			60.0	2.3	900 +	5	+1		
0068	N9205105										
0069	N9205101										
0070	N9205102										
0071	N9203504	2M									
0072	N9203501	1M									
0073	N9203502	2M			57.2	2.2	840	6	0		
0074	N9203503	3M			59.0	2.5	900 +	5	+1		
*0075	C1017772	2M			58.9	2.0	805	5	0		
0076	N9200202	1H									
0077	N9200201	1H	8.29	6	58.4	2.0	830	5	0	114	
*0078	C1017772	2H			64.3 +2	2.9	930 +2	3	+1		
0079	N9202005	3H									
0080	N9202003										

* = standard mean nursery flour protein = 11.2 mill used = Quad

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UMHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0081	POPE 1/N8203005	N9202004	HRW	58.3	48	12.9	63.2	30.0	0.34 -	80.6 -	11.3	54.8
0082	HNL/ARBON//DUSTY	D9201402	HRW	55.9 -	48	11.6	67.3 +2	34.0	0.36 -2	83.9	10.2	53.6
0083	HNL/ARBON//DUSTY	D9201403	SWW	56.4 -	9	11.3	64.7	41.7	0.27 +	86.3 +	9.0 -	50.7 -2
0084	HNL/ARBON//DUSTY	N9201401	HRW		39	12.2						
0085	C82-2//N73101/CDN	N9200401	HRW	56.8 -	49	12.3	63.2	31.3	0.32	81.7	10.6	54.8
0086	C82-2//N73101/CDN	D9200402	HRW	56.9 -	46	12.0	63.1	31.1	0.31	82.1	10.7	54.1
0087	VPM/MC//WA5909/N700149	D9200101	HRW	56.6 -	67	13.5 +	64.3	31.9	0.31	83.3	11.7	53.7
0088	VPM/MC//WA5909/N700149	D9200102	HRW	57.2	67	13.9 +	64.1	32.4	0.32	82.6	12.0 +	57.2
0089	VPM/MC//WA5909/N700149	N9200103	HRW	57.7	63	12.2	64.2	30.5	0.32	82.7	10.7	55.0
*0090	HATTON 20	C1017772	HRW	59.0	55	11.7	64.4	33.5	0.30	84.0	10.2	56.1
0091	BATUM 16-20	PI495013	HRW	56.4 -	51	12.3	67.7 +2	33.1	0.32	86.4 +	10.8	56.1
0092	VPM/MC//WA5909/N700149	D9200104	HRW	56.6 -	60	12.1	65.1	34.5	0.33 -	83.1	10.7	56.2
0093	VPM/MC//WA5909/N700149	D9200105	HRW	57.9	56	12.4	65.3 +	32.1	0.36 -2	81.8	10.7	55.1
0094	N8200101/N8302701	N9202204	HRW	58.0	51	12.5	67.0 +2	34.4	0.31	86.2 +	10.9	57.5
0095	N8200101/N8302701	N9202201	HRW	56.9 -	57	13.7 +	63.6	31.4	0.31	82.6	12.0 +	58.1
0096	N8200101/N8302701	N9202202	HRW	56.3 -	53	14.3 +	63.4	30.5	0.32	81.9	12.1 +	58.0
0097	N8200932/N8302703	N9202603	HRW	57.1	48	12.2	64.6	32.7	0.33 -	82.6	10.6	55.1
0098	N8200932/N8302703	N9202604	HRW	58.0	46	11.8	65.1	34.2	0.34 -	82.6	10.1	54.2
0099	N8200932/N8302703	N9202605	HRW	56.9 -	52	14.8 +	64.6	31.5	0.33 -	82.6	12.3 +	55.8
0100	N8201514/N8200503	N9202902	HRW	57.8	57	13.7 +	65.8 +	35.1	0.27 +	87.0 +	11.7	56.1
0101	N8201514/N8200503	N9202903	HRW	56.9 -	49	12.9	63.2	35.2	0.30	82.7	11.1	54.1
0102	N8201514/N8200503	N9202901	HRW	58.1	53	13.2	64.8	35.4	0.26 +2	86.5 +	11.1	55.2
*0103	HATTON 21	C1017772	HRW	58.7	51	11.8	65.4	34.1	0.30	85.0	10.2	55.3
0104	N8200602/N8202503	N9202504	HRW	56.6 -	49	14.5 +	63.2	30.9	0.28 +	83.8	12.0 +	56.2
0105	C82-12/HTN	D9200903	HRW	56.8 -	41	12.2	57.8 -2	28.0	0.32	76.0 -2	10.4	55.3
0106	C82-12/HTN	N9200901	HRW	56.3 -	49	13.5 +	63.1	32.8	0.26 +2	84.7	11.9 +	55.2
0107	WA6365/TX69A450-1//ID281	N9202802	HRW	57.5	52	13.1	62.1 -	27.2	0.35 -2	79.0 -2	11.4	56.7
0108	WA6365/TX69A450-1//ID281	N9202803	HRW	58.4	51	12.5	62.8 -	30.2	0.32	81.3	11.0	53.2 -
0109	WA6365/TX69A450-1//ID281	N9202804	HRW	58.2	49	12.9	60.1 -2	27.9	0.30	79.5 -	11.4	57.8
0110	WA6365/TX69A450-1//ID281	N9202805	HRW	58.6	47	12.8	62.2 -	31.7	0.34 -	79.6 -	11.0	55.6
0111	WA6365/TX69A450-1//ID281	N9202806	HRW		44	13.1						
*0112	HATTON 22	C1017772	HRW	58.5	55	11.2	62.5	33.7	0.32	80.9	10.0	56.4

* = standard mean nursery flour protein = 11.2 mill used = Quad

Standard Mean	HRW	58.7	55	11.8	64.2	33.7	0.31	83.2	10.4	56.1
Nursery Mean	SWW	57.2	10	12.6	63.1	39.4	0.29	83.1	10.1	54.3
Nursery Standard deviation	SWW	1.20	2.1	1.77	2.19	3.25	0.028	4.60	1.63	5.16
Standard Mean	HRW	58.7	55	11.8	64.2	33.7	0.31	83.2	10.4	56.1
Nursery Mean	HRW	57.8	52	12.9	64.0	31.7	0.31	83.1	11.3	56.9
Nursery Standard deviation	HRW	0.80	6.2	0.75	1.97	2.06	0.024	2.62	0.63	1.84
Standard Mean	HRW	58.7	55	11.8	64.2	33.7	0.31	83.2	10.4	56.1
Nursery Mean	HRW	57.5	51	12.6	62.5	31.0	0.31	81.4	10.9	55.6
Nursery Standard deviation	HRW	0.74	8.7	0.66	2.73	1.62	0.031	2.18	0.66	1.82

SAMPLE#	BREEDER#	MTYPE	CODI	TGS	BABS	MTIME	LVOL	BCRGR	PROQ	RVA	COLOR*
0081	N9202004	2H			59.0	2.1	905 +2	6	+1		
0082	D9201402	2H	8.54	7						109	
0083	D9201403	6L	9.14	8						40	
0084	N9201401										
0085	N9200401	5M	7.97	6	60.5	3.5 +	760 -	8	-1	84	
0086	D9200402	6M	8.09	6	58.3	3.4 +	735 -2	8	-1	87	
0087	D9200101	4H	7.78	6	61.9 +	3.6 +	900 +	5	0	138	U
0088	D9200102	2H	8.15	6	62.4 +	2.5	850	5	-1	143	U
0089	N9200103	2H									
*0090	C1017772	2H			60.3	2.0	845	6	+1		
0091	P1495013	2H			60.3	2.2	895 +	6	+1		
0092	D9200104	4M	8.41	6	60.9	3.3	865 +	5	+1	131	
0093	D9200105	3M	8.16	6	59.3	2.3	835	5	0	106	
0094	N9202204	6M			61.7 +	4.3 +	870 +	5	0		
0095	N9202201	1H									
0096	N9202202	1H									
0097	N9202603	2M									
0098	N9202604	4M									
0099	N9202605	2H									
0100	N9202902	2H			60.3	2.2	900 +	4	0		
0101	N9202903	2H									
0102	N9202901	3M			59.4	2.0	850	5	0		
*0103	C1017772	2M			60.5	2.2	775	6	-1		
0104	N9202504	2H			60.9	2.1	815	6	-1		
0105	D9200903	2M	8.20	3						79	
0106	N9200901	1H									
0107	N9202802	3H			59.9	3.1	895 +	6	0		
0108	N9202803	2H	8.09	5						143	U
0109	N9202804	3H			62.0 +	2.6	945 +2	4	+1		
0110	N9202805	3M			58.8	2.1	815	8	-1		
0111	N9202806										
*0112	C1017772	3M			58.6	2.1	835	6	+1		

* = standard mean nursery flour protein = 11.2 mill used = Quad

HRW											
SWW			9.15	8	59.3	2.1	822	5		86	
SWW			0.014	0.0						65.1	
HRW					59.3	2.1	822	5			
HRW					60.7	2.5	869	5			
HRW					1.82	0.65	41.0	0.9			
HRW					59.3	2.1	822	5			
HWW			8.23	5	60.8	2.8	844	6		116	
HWW			0.198	1.0	1.49	0.64	58.1	1.7		27.4	

COMMENTS: Quality parameters of HRW and HWW selections in this nursery were graded by comparison to the standard mean of Hatton. All selections were initially screened for adequate NIR wheat hardness and protein content. In this nursery, NIR wheat hardness value of several lines was found to be less than 50. This included both red and white lines. Those HRW lines which had NIR wheat hardness value less than about 43 were excluded from further testing, their classification, however, was left as HRW. All white wheat lines with NIR wheat hardness less than 50 were kept for further testing. These were classified as HWW, except for Breeder #'s D9204802 and D9201403, which were classified as SWW. The standard mean NIR wheat hardness value for Hatton was 55, which would be in the questionable range for hard wheat classification. This nursery was weathered and this obviously influenced wheat hardness value as well as other quality parameters to some degree. Test weight was somewhat lowered by the weathering and this contributed to lower flour yield and/or milling score. Several lines had flour yield and/or milling score significantly less than the standard mean of Hatton, however, many were comparable and several had significantly higher flour yield and/or milling score than Hatton. Most selections, including Hatton had very short dough mixing time as exhibited by this mixogram and by bake mixing time (MIXIME). The mixogram of several selections was typed as 2H and several were typed as 1H, 2M, 3M and 4M. Hatton is considered too short in mixing time. Minimum dough mixing time for bread type wheats should be 3 minutes; however, the most desirable mixing time is around 4-5 minutes. Only those selections which had mixogram type properties equal to Hatton or better were bread baked. Most selections, including Hatton had lower than expected absorption as determined by the mixogram (MABS) and baking (BABS) for their flour protein content. Loaf volume of several selections was equal to that expected for their flour protein content; a few had loaf volume which significantly exceeded that expected and some had loaf volume significantly less than that expected for their flour protein content as graded by their protein quality (PROQ) rating. The man nursery flour protein content was 11.2% and at this level one should expect a loaf volume near 865 cc if the protein is of good quality. Bread crumb grain score of several selections was judged to be comparable to Hatton, some were judged to be somewhat better and a few somewhat less in score. Cookies were baked on all SWW and HWW selections. Breeder #'s D9204802 and D9201403 (classified as SWW) had very satisfactory cookie diameter and top grain score. All of the HWW classified selections had poor cookie diameter and top grain score. Since no appropriate SWW check variety was included in this nursery, no grading by comparison of cookie diameter and top grain score to a standard mean was possible. Rapid Visco Analyzer (RVA) viscosity was determined on all SWW and HWW selections. RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable. Alkaline flour color (COLOR) was scored on those lines which had RVA viscosity of near 150 and higher. *Color represents an extremely important quality criterion in Asian types of noodles. A preliminary alkaline flour color test was initiated. An alkaline Pekar slick was used to subjectively measure flour color. The Pekar slick was prepared by pressing flour to a smooth surface, immersing in a 1.0% alkaline solution consisting of 60% K₂CO₃ and 40% Na₂CO₃ for 2 minutes. The sample rested at a room temperature of (77°F) for 4 hours before visual observation and scoring. Flours were scored by the following: S = satisfactory, Q = questionable, and U = unsatisfactory. Desirable flour color ranges from bright white through creamy yellow to bright yellow. Any dullness, brown, or greenish casts would be unacceptable. Alkaline flour color (COLOR) is scored only on SWW, HWW, SWS and HWS wheats which have a minimum RVA viscosity of 150 and a minimum NIR wheat hardness (UWHRD) value of 40.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0001	C82-8/HTN	D9200704	HRW	57.9	52	12.6	58.0 -2	29.5	0.32	76.2 -2	10.4	54.1
0002	POPE 1/N8203005	N9202001	HRW	58.3	53	12.9	61.4 -2	29.6	0.31	80.3 -	10.8	55.2
0003	POPE 1/N8203005	N9202002	HRW	58.1	55	13.1	61.5 -2	29.4	0.30	80.9 -	11.0	52.8 -
*0004	HATTON	C1017772	HRW	58.7	61	12.0	67.5	32.7	0.33	85.6	10.5	53.0
0005	AE/VPM/MC//ANDREWS	N9203802	HRW	56.8 -	62	12.8	64.7	30.2	0.35 -2	81.7 -	10.8	54.1
0006	BFR84012/N86077	N9205006	HRW	56.2 -	57	12.2	66.5 +	32.3	0.31	85.6	10.7	56.2
0007	BFR84012/N86077	N9205007	HRW	56.7 -	54	13.4 +	65.5	31.7	0.29	85.6	11.4	57.0
0008	BFR84012/N86077	N9205008	HRW	56.7 -	53	12.0	67.0 +	31.4	0.30	86.7 +	10.6	56.5
0009	WA7171/WA7163//KVZ/17271	N9206004	HRW	58.1	55	11.6	65.2	31.2	0.34 -	82.7	10.2	56.4
0010	WA7269/WA7168//CER/MC	N9206201	SRW		45	13.1						
*0011	HATTON 24	C1017772	HRW	58.7	57	12.0	64.0	32.3	0.30	83.6	10.3	56.7
0012	C82-22/HTN	N9201001	HRW	56.2 -	57	14.4 +	61.4 -2	28.4	0.35 -2	78.2 -2	12.6 +	56.5
0013	VPM/MC//WA5909/N700149	N9200106	HRW	57.6	74	13.0	63.4 -	28.9	0.36 -2	79.8 -2	11.3	55.5
0014	VPM/MC//WA5909/N700149	D9200107	HRW	56.4 -	68	12.5	64.6	33.3	0.29	84.7	10.7	57.4
0015	N8400403/N8309406	N9203902	HRW	56.4 -	63	12.8	62.5 -2	28.3	0.34 -	79.9 -	11.1	55.7
*0016	HATTON 25	C1017772	HRW	58.5	53	11.0	65.0	31.6	0.29	85.1	9.8	55.7
0017	NLY/LJN//N7301004/CER	N9205801	HRW	58.8	61	12.1	63.7 -	31.0	0.29	83.8	10.4	56.0
*0018	HATTON 26	C1017772	HRW	58.6	59	11.8	65.2	33.3	0.29	85.3	10.3	57.7
0019	DUSTY/N820905//CER/N7301	N9203401	HRW	59.1	61	13.2	62.9 -	27.3	0.38 -2	78.2 -2	11.0	56.4
0020	N8400403/N8309406	N9203901	HRW	57.0	50	12.5	64.1	35.1	0.34 -	81.6 -	10.7	59.7 +
0021	AE/VPM/MC//HTN	N9203702	HRW	59.0	63	13.9 +	64.1	30.5	0.33 -	82.1	12.0 +	57.5
*0022	HATTON 27	C1017772	HRW	58.9	56	11.3	64.8	34.1	0.31	83.9	10.1	56.7
0023	C82-22/BATUM	N9200603	HRW	58.1	56	13.2	64.7	29.7	0.29	84.8	11.7 +	59.0
0024	ELGIN/PI166910//ANDREWS	N9200302	SRW		44	12.3						
0025	WA007173/N8200602	N9201904	HRW	57.8	57	12.3	63.9	33.1	0.32	82.4	10.6	58.0
*0026	HATTON 28	C1017772	HRW	58.7	47	12.6	64.6	32.8	0.30	84.2	10.5	56.7
0027	ID280/WA6817//N85025	D9204402	HRW	58.0	65	13.0	66.3 +	30.1	0.30	86.0	11.3	61.7 +
0028	N8200101/N8200602	N9202104	HRW	57.9	53	13.4 +	64.4	32.7	0.29	84.5	11.3	60.7 +
0029	WA56910/N848301//ANDREWS	N9205401	SRW		46	11.5						
*0030	HATTON 29	C1017772	HRW	58.6	53	10.8	64.7	34.9	0.31	83.8	9.2	56.9
0031	UT132534/WA007168	N9201301	SRW		25	13.4 +						
*0032	HATTON 30	C1017772	HRW	58.7	57	10.7	64.3	33.4	0.30	83.9	9.7	56.8
0033	BATUM 23-30	P1495013	HRW	56.6 -	53	11.9	68.5 +2	33.9	0.29	88.8 +2	10.4	59.7 +
0034	C82-12/HTN	N9200905	HRW	55.1 -2	59	14.9 +2	61.7 -2	31.5	0.29	81.7 -	13.0 +	59.5 +
0035	C82-12/HTN soft	D9200906	HRW	55.1 -2	62	15.5 +2	58.8 -2	29.7	0.31	77.6 -2	13.5 +2	59.8 +
0036	C82-12/HTN	N9200907	HRW	55.0 -2	53	15.0 +2	62.8 -	32.8	0.29	82.8	13.2 +2	59.7 +
0037	C82-12/HTN	N9200908	SRW		41	15.6 +2						
0038	UT132534/WA7168	N9201302	HRW	55.8 -	57	14.3 +	64.8	32.2	0.31	83.9	12.9 +	64.8 +2
0039	UT132534/WA7168	N9201303	SRW		20	14.2 +						
0040	N8400403/N8309406	N9203903	HRW	54.8 -2	73	15.0 +2	62.7 -	31.2	0.34 -	80.1 -	13.3 +2	64.8 +2

* = standard mean nursery flour protein = 11.6 mill used = Quad

SAMPLE#	BREEDER#	MTYPE	BABS	MTIME	LVOL	BCRGR	PROQ	RVA	COLOR*
0001	D9200704	1M						109	Q
0002	N9202001	1M							
0003	N9202002	1H							
*0004	C1017772	2H	56.2	1.9	785	7	-1		
0005	N9203802	2H	56.3	2.2	715	8	-1		
0006	N9205006	3H	60.4	3.1	825	5	0		
0007	N9205007	3H	59.2	3.1	800	6	-1		
0008	N9205008	6M	60.7	3.1	795	6	-1		
0009	N9206004	2H	60.6	1.9	770	6	-1		
0010	N9206201								
*0011	C1017772	2H	58.9	2.1	775	6	-1		
0012	N9201001	2M							
0013	N9200106	2H	59.7	1.9	765	9	-1		
0014	D9200107	4M	61.6	3.0	805	5	-1	126	U
0015	N9203902	2H							
*0016	C1017772	2H	58.9	2.3	725	6	-1		
0017	N9205801	2H	60.2	2.5	730	8	-1		
*0018	C1017772	2H	61.9	2.1	750	5	-1		
0019	N9203401	3H	60.6	2.6	770	5	-1		
0020	N9203901	3H	63.9	3.3	920	4	+1		
0021	N9203702	2H	61.7	2.2	755	7	-1		
*0022	C1017772	2H	60.9	2.3	770	5	-1		
0023	N9200603	2H	63.2	1.9	835	7	-1		
0024	N9200302								
0025	N9201904	3H	62.2	3.0	760	5	-1		
*0026	C1017772	2H	60.9	2.2	770	6	-1		
0027	D9204402	3H	64.9	2	840	5	-1	120	Q
0028	N9202104	2H	63.9	2.0	900	6	+1		
0029	N9205401								
*0030	C1017772	3M	60.1	2.2	785	5	+1		
0031	N9201301								
*0032	C1017772	2M	60.0	2.0	825	6	+1		
0033	P1495013	2H	59.9	1.7	890	4	+1		
0034	N9200905	1H							
0035	D9200906	2H							
0036	N9200907	1M							
0037	N9200908								
0038	N9201302	3H	65.5	2.8	990	2	0		
0039	N9201303								
0040	N9203903	3H	67.0	3.3	1065	2	+1		

* = standard mean nursery flour protein = 11.6 mill used = Quad

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0041	N8400403/N8309406	N9203904	SRW	56.6 -	45	15.1 +2	64.9	30.2	0.30	84.5	13.5 +2	64.8 +2
0042	N8400403/N8309406	N9203905	HRW	54.3 -2	50	15.1 +2	61.5 -2	32.1	0.30	80.9 -	13.2 +2	64.7 +2
0043	N8400403/N8309406	N9200906	HRW	55.6 -	56	15.1 +2	61.9 -2	31.3	0.30	81.4 -	13.2 +2	58.7
0044	C82-12/HTN	N9205107	HRW	54.2 -2	59	15.6 +2	59.4 -2	26.8	0.37 -2	75.1 -2	13.4 +2	58.8
0045	77-367/FR50//BATUM rogue											
0046	77-367/FR50//BATUM rogue	N9205108	HRW	55.7 -	55	15.0 +2	64.2	28.7	0.34 -	81.7 -	12.9 +	64.9 +2
0047	77-367/FR50//BATUM rogue	N9205109	HRW	55.3 -	56	17.0 +2	59.7 -2	27.6	0.37 -2	75.4 -2	15.5 +2	65.8 +2
0048	77-367/FR50//BATUM rogue	N9205110	HRW	58.0	64	14.5 +	60.6 -2	27.2	0.34 -	77.9 -2	12.6 +	64.8 +2
0049	NLY/LJN//N7301004/CER	N9205803	HRW	54.4 -2	58	14.7 +	60.2 -2	27.9	0.34 -	77.5 -2	12.7 +	64.1 +2
0050	NLY/LJN//N7301004/CER	N9205804	HRW	54.7 -2	60	14.7 +	61.4 -2	30.4	0.33 -	79.3 -2	13.0 +	59.0
0051	D86077/N86048	N9206103	HRW	57.0	56	12.6	63.9	28.8	0.29	84.0	11.4	60.9 +
0052	77-367/FR-50//BATUM rogu	N9205106	HRW	55.5 -	61	15.6 +2	59.8 -2	28.6	0.35 -2	76.6 -2	13.7 +2	63.9 +2
*0053	HATTON 31	C1017772	HRW	57.7	70	13.7	63.4	31.2	0.33	81.4	12.3	59.6
0054	POPE 11/N8203005	N9206502	HRW	56.8 -	56	13.6 +	59.9 -2	26.4	0.31	78.8 -2	11.3	60.3 +
0055	POPE 11/N8203005	N9206503	HRW	58.9	61	13.4 +	64.4	28.1	0.32	82.9	11.9 +	61.3 +
0056	N8200503/N8203005	N9206801	HRW	57.3	56	13.5 +	63.5 -	29.7	0.33 -	81.5 -	11.4	59.8 +
0057	C82-17//HTN/CTK	N9206901	SRW		46	12.7						
0058	C82-8/HTN	N9200709	HRW	58.0	52	13.9 +	63.5 -	30.5	0.31	82.5	12.0 +	55.9
0059	ID 280/JOHN	N9201110	HRW	57.0	55	12.5	65.4	32.3	0.32	84.0	11.2	59.9 +
0060	ID 280/JOHN	N9201111	HRW	58.0	68	13.1	63.7 -	30.7	0.34 -	81.2 -	11.6	61.4 +
0061	LR-28/HTN	N9206401	HRW	57.3	67	12.5	63.4 -	29.6	0.33 -	81.4 -	11.3	58.5
0062	DUSTY/P1192387	N9200203	HRW	56.9	61	13.0	63.3 -	29.0	0.31	82.3	11.5	55.5
0063	POPE 11/N8203005	N9206501	HRW	57.8	68	15.0 +2	60.8 -2	28.7	0.32	79.2 -2	12.8 +	61.7 +
0064	N8200101/N8302701	N9202205	HRW	57.0	53	13.3 +	63.8	29.7	0.29	83.9	11.4	59.7 +
0065	DUSTY/N820905//CER/N7301	N9203402	HRW	55.7 -	50	14.3 +	58.2 -2	29.8	0.35 -2	74.9 -2	12.2 +	60.5 +
0066	AE/VPM/MC//HTN	N9203703	HRW	57.1	70	15.5 +2	62.7 -	31.4	0.34 -	80.1 -	13.8 +2	62.7 +2
0067	AE/VPM/MC//HTN	N9203704	HRW	57.3	55	13.6 +	64.2	32.2	0.30	83.8	12.2 +	58.7
0068	AE/VPM/MC//HTN	N9203705	HRW	57.5	66	13.5 +	64.1	31.2	0.31	83.1	12.0 +	58.7
0069	AE/VPM/MC//ANDREWS	N9203803	HRW	56.8 -	64	12.5	63.8	31.4	0.29	83.9	11.0	56.9
0070	N8201905/UT132569	N9206601	HRW	56.8 -	62	12.8	64.0	30.3	0.27 +	85.1	11.3	61.7 +
0071	CER/HTN s//N8400901	N9204203	HRW	58.0	56	11.7	64.0	35.1	0.28 +	84.6	10.3	57.8
0072	C82-17//HTN/CTK	N9206902	HRW	57.9	58	12.6	65.4	32.8	0.29	85.5	11.3	59.7 +
0073	ID281/WA7168//N8503703	N9206701	HRW	57.5	56	12.4	62.5 -2	31.4	0.28 +	83.0	11.3	61.7 +
0074	ID281/WA7168//N8503703	N9206702	HRW	56.8 -	61	14.1 +	60.9 -2	30.8	0.28 +	81.4 -	12.0 +	60.5 +
0075	ID281/WA7168//N8503703	N9206703	HRW	57.3	56	12.6	62.9 -	32.2	0.31	81.9 -	10.9	58.7
0076	ID281/WA7168//N8503703	N9206704	HRW	57.3	60	11.8	63.2 -	33.3	0.30	82.7	10.6	58.8
0077	WA7269/WA7168//CER/MC	N9206202	HRW	56.8 -	53	14.4 +	61.6 -2	30.2	0.30	81.1 -	12.5 +	61.8 +
0078	77364/FR20//N741612/PANA	N9204902	SRW		44	13.2						

* = standard mean nursery flour protein = 11.6 mill used = Quad

Standard Mean	58.6	11.8	64.8	33.1	0.31	84.1	10.3	56.6
Nursery Mean	57.5	13.2	62.2	30.2	0.31	81.1	11.4	58.8
Nursery Standard deviation	0.62	0.91	2.45	1.97	0.021	3.05	0.77	3.53
Standard Mean	58.6	11.8	64.8	33.1	0.31	84.1	10.3	56.6
Nursery Mean	57.0	13.4	63.4	31.0	0.31	82.2	11.7	59.1
Nursery Standard deviation	1.34	1.38	2.08	2.09	0.025	2.93	1.25	3.08
Standard Mean	58.6	11.8	64.8	33.1	0.31	84.1	10.3	56.6
Nursery Mean		13.5						
Nursery Standard deviation		9.9						

SAMPLE#	BREEDER#	MTYPE	BABS	MTIME	LVOL	BCRGR	PROQ	RVA	COLOR*
0041	N9203904								
0042	N9203905	3H	67.0 +2	3.4	1120 +2	2	+1		
0043	N9203906	2H							
0044	N9200904	1H							
0045	N9205107	1H							
0046	N9205108	2H	65.1 +2	2.0	970 +2	4	0		
0047	N9205109	1H							
0048	N9205110	3H	67.0 +2	3.6 +	1000 +2	3	+1	161	U
0049	N9205803	2H							
0050	N9205804	1M							
0051	N9206103	7M	62.1	4.1 +	830 +	5	-1		
0052	N9205106	1H							
*0053	C1017772	2H	61.8	2.4	920	5	0		
0054	N9206502	3H	63.5 +	3.1	865 +	6	0		
0055	N9206503	5H	63.5 +	4.3 +	885 +2	5	-1		
0056	N9206801	4M	63.0 +	2.6	865 +	4	0		
0057	N9206901								
0058	N9200709	1M						88	Q
0059	N9201110	3M	63.1 +	2.2	845 +	5	0		
0060	N9201111	3H	63.6 +	2.5	875 +2	5	0		
0061	N9206401	3M	60.7	2.1	900 +2	6	+1		
0062	N9200203	1H							
0063	N9206501	2H	64.9 +2	2.0	905 +2	4	-1		
0064	N9202205	4H	62.9 +	3.0	890 +2	4	0		
0065	N9203402	3H	62.7 +	3.3	875 +2	5	-1		
0066	N9203703	2H	64.9 +2	1.9	940 +2	4	-1		
0067	N9203704	1M							
0068	N9203705	1H							
0069	N9203803	2H	59.1	1.5	760	8	-1		
0070	N9206601	3H	63.9 +	2.8	890 +2	6	0		
0071	N9204203	7M	60.0	3.5 +	795	6	0		
0072	N9206902	2M	61.9	2.2	880 +2	6	0		
0073	N9206701	3H	63.9 +	2.2	815	6	-1		
0074	N9206702	2H	62.7 +	1.9	885 +2	5	-1	72	Q
0075	N9206703	4M	62.4 +	2.5	815	5	-1	127	Q
0076	N9206704	4M	62.0	3.5 +	840 +	6	0	119	Q
0077	N9206202	6H	63.5 +	5.9 +2	860 +	5	-1		
0078	N9204902								

* = standard mean nursery flour protein = 11.6 mill used = Quad

HRW	60.0	2.2	789	6	
HW	63.8	3.0	876	5	115
HW	2.11	0.73	73.8	1.1	26.8

HRW	60.0	2.2	789	6
HRW	61.9	2.6	844	5
HRW	2.41	0.81	86.6	1.5

COMMENTS: Quality parameters of HRW and HWW selections in this nursery were graded by comparison to the standard mean of Hatton. All selections were initially screened for adequate NIR wheat hardness and protein content. Nine selections had NIR wheat hardness value less than 50 and were classified as SRW. These selections were excluded from further testing. Those selections which survived the initial screening were milled. Flour yield and/or milling score of several selections was comparable to the standard mean of Hatton, however, several had flour yield and/or milling score significantly less than that of the standard mean. Sample #'s 920006, 920008, 920027 and 920034 had exceptionally higher flour yield and/or milling score. Most selections, including Hatton had short dough mixing time as exhibited by their mixograms. Most were typed between 1-3H and between 1M-3M. Hatton is considered too short in mixing time. Desirable dough mixing time for bread type wheats should be a minimum of 3 minutes; however the most desirable mixing time is around 4-5 minutes. Only those selections which had mixogram type properties equal to Hatton or better were bread baked. Most selections had lower than expected water absorption as determined by mixogram (MABS) and baking absorption (BABS) for their flour protein content. Loaf volume of 21 selections, including some of the Hattons, was equal to or significantly higher than that expected for their flour protein content as graded by their protein quality (PROQ) rating. All other lines had loaf volume significantly less than that expected for their flour protein content. The mean nursery flour protein content was 11.6% and at this level one should expect a loaf volume near 890 cc, if the protein is of good quality. Sample #'s 920038, 920040, 920042, 920046 and 920048 had exceptionally good loaf volume compared to Hatton. These lines also had satisfactory or near satisfactory bread crumb grain score, higher bake absorption and generally longer mixing time. Bread crumb grain score of most lines was judged to be fairly comparable or slightly better than that of Hatton.

Rapid Visco Analyzer (RVA) viscosity was determined on all HWW lines. RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable. Alkaline flour color (COLOR) was scored on all HWW lines. *Color represents an extremely important quality criterion in Asian types of noodles. A preliminary alkaline flour color test was initiated. An alkaline Pekar slick was used to subjectively measure flour color. The Pekar slick was prepared by pressing flour to a smooth surface, immersing in a 1.0% alkaline solution consisting of 60% K₂CO₃ and 40% Na₂CO₃ for 2 minutes. The sample rested at a room temperature of (77°F) for 4 hours before visual observation and scoring. Flours were scored by the following; S = satisfactory, Q = questionable, and U = unsatisfactory. Desirable flour color ranges from bright white through creamy yellow to bright yellow. Any dullness, brown, or greenish casts would be unacceptable. Alkaline flour color (COLOR) is scored only on SWW, HWW, SWS and HWS wheats which have a minimum RVA viscosity of 150 and a minimum NIR wheat hardness (UMHRD) value of 40.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0001	RR1/SPN D89029	D8929.01	HRW	56.5 -2	76	15.5	63.5 +	28.4	0.37 -	79.4	14.0	63.9
0002	RR1/3/503552//13438/BURT	D8930.01	HRW	58.6 -	89	17.9 +	59.5 -2	25.9	0.40 -2	73.6 -2	15.6	66.0
0003	RR1/C82020//OK820377	D8931.02	HRW	58.2 -	57	16.4	60.7	30.1	0.36	77.0	14.5	63.8
0004	RR1//C82020//OK820377	D8931.03	HRW	58.6 -	65	15.7	61.4	30.3	0.35	78.2	14.4	63.4
0005	RR1//C82020//OK820377	D8931.06	HRW	56.6 -2	105	16.6	58.7 -2	29.3	0.37 -	74.4 -	14.8	58.8 -2
0006	RR1//C82020//OK820377	D8931.07	HRW	56.6 -2	76	16.9	59.1 -2	29.4	0.38 -	74.3 -2	14.6	59.8 -2
0007	RR1//C82020//OK820377	D8931.09	HRW	56.7 -2	63	15.8	64.5 +2	29.7	0.37 -	80.4	14.4	60.7 -
0008	RR1//C82020//OK820377	D8931.12	HRW	58.0 -	57	16.6	61.4	31.0	0.32 +	79.8	14.3	59.9 -2
0009	RR1//C82020//OK820377	D8931.13	HRW	58.1 -	71	16.5	63.9 +	31.3	0.39 -	78.8	15.1	59.9 -2
0010	RR1//C82021//NE820658	D8932.15	HRW	59.4	69	17.3 +	60.7	27.4	0.37 -	76.5	15.1	65.9
0011	RR1//C82021//NE820658	D8932.31	HRW	58.3 -	93	17.5 +	63.3 +	26.9	0.46 -2	74.5 -	16.2 +	65.9
0012	RR1//C82021//NE820658	D8932.32	HRW	57.7 -	85	18.0 +	63.3 +	28.1	0.45 -2	75.0 -	16.5 +	65.8
0013	RR1//C82021//NE820658	D8932.37	HRW	58.4 -	85	17.6 +	63.5 +	28.2	0.44 -2	75.7 -	16.3 +	65.7
0014	RR1//C82021//NE820658	D8932.45	HRW	58.2 -	90	17.1 +	64.0 +2	30.5	0.39 -	78.9	15.3	65.9
*0015	HATTON	C1017772	HRW	60.9	87	15.5	61.8	29.3	0.35	78.6	14.3	66.1
0016	N8203105//N8106201	WA007679	HRW	56.9 -2	88	17.2 +	61.2	28.7	0.35	78.0	15.2	64.8

* = standard mean nursery flour protein = 15.0 mill used = Quad

Standard Mean	HRW	60.9	87	15.5	61.8	29.3	0.35	78.6	14.3	66.1
Nursery Mean	HRW	56.7	82	16.4	62.3	28.5	0.36	78.7	14.6	64.3
Nursery Standard deviation	HRW	0.28	8.5	1.20	1.63	0.21	0.014	0.99	0.85	0.64
Standard Mean	HRW	60.9	87	15.5	61.8	29.3	0.35	78.6	14.3	66.1
Nursery Mean	HRW	58.2	78	16.8	61.8	29.1	0.39	76.8	15.1	63.4
Nursery Standard deviation	HRW	1.14	14.7	0.80	1.94	1.60	0.040	2.28	0.78	2.91

SAMPLE#	BREEDER#	MTYPE	BABS	MTIME	LVOL	BCRGR	PROQ	RVA	COLOR*
0001	D8929.01	2H	66.1	1.4 -	840 -	6	-1	232	S
0002	D8930.01	3H	68.2	3.4	1075 +2	2	-1		
0003	D8931.02	1H	66.0 -	1.7 -	865	6	-1		
0004	D8931.03	2H	65.1 -	1.8	910	6	-1		
0005	D8931.06	2M	62.0 -2	1.9	780 -2	8	-1		
0006	D8931.07	2M	62.0 -2	1.4 -	785 -2	8	-1		
0007	D8931.09	2H	62.9 -2	1.6 -	800 -2	8	-1		
0008	D8931.12	1H	62.1 -2	1.4 -	780 -2	6	-1		
0009	D8931.13	1H	60.6 -2	1.1 -	870	6	-1		
0010	D8932.15	3H	68.1	4.2	1120 +2	3	0		
0011	D8932.31	2H	68.1	2.2	1030 +2	4	-1		
0012	D8932.32	2H	68.0	1.9	1090 +2	3	-1		
0013	D8932.37	2H	67.9	2.1	1075 +2	5	-1		
0014	D8932.45	2H	68.1	2.8	990 +2	3	-1		
*0015	C101772	3H	68.3	3.1	900	4	-1		
0016	WA007679	2H	69.0	3.0	975 +	4	-1	259	Q

* = standard mean nursery flour protein = 15.0 mill used = Quad

HRW	68.3	3.1	900	4	
HW	67.6	2.2	908	5	246
HW	2.05	1.13	95.5	1.4	19.1

HRW	68.3	3.1	900	4	
HRW	65.5	2.2	934	5	
HRW	2.97	0.88	126.9	2.0	

COMMENTS: Quality parameters of HRW and HW selections in this nursery were graded by comparison to the standard mean of Hatton. The mean nursery wheat protein content was very high; (HRW-16.8%) and (HW-16.4%). Sample #'s 920001, 920007, 920009 and 920011-920014 had flour yield significantly higher than Hatton, however, some of these lines had elevated flour ash content and this contributed to their milling score being only comparable to or even significantly less than Hatton. Mixograms of most lines were typed from 1-2H, which show short mixing time (undesirable). Sample #'s 920002, 920010, 920015 and 920016 had bake mix time (MTIME) of three minutes or longer. Water absorption of these lines varied considerably with some having quite low water absorption (poor). Sample #'s 920002, 920010-920014, and 920016 had outstanding loaf volume in comparison to Hatton and their bread crumb score was comparable to or better than that of Hatton. Loaf volume of all lines except Sample #920010 was significantly less than that expected for their flour protein content as graded by their protein quality (PROQ) rating. The mean nursery flour protein content was 15.0% and at this level, one should expect a loaf volume near 1115 cc, if the protein is of good quality. Rapid Visco Analyzer (RVA) viscosity was determined on all HW lines. RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable. Alkaline flour color (COLOR) was scored on all HW lines. *Color represents an extremely important quality criterion in Asian types of noodles. A preliminary alkaline flour color test was initiated. An alkaline Pekar slick was used to subjectively measure flour color. The Pekar slick was prepared by pressing flour to a smooth surface, immersing in a 1.0% alkaline solution consisting of 60% K₂CO₃ and 40% Na₂CO₃ for 2 minutes. The sample rested at a room temperature of (77°F) for 4 hours before visual observation and scoring. Flours were scored by the following; S = satisfactory, Q = questionable, and U = unsatisfactory. Desirable flour color ranges from bright white through creamy yellow to bright yellow. Any dullness, brown, or greenish casts would be unacceptable. Alkaline flour color (COLOR) is scored only on SWW, HW, SWS and HWS wheats which have a minimum RVA viscosity of 150 and a minimum NIR wheat hardness (UWHRD) value of 40.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0001	RRI//C82020/OK820377	D8931.14	HRW	55.2 -2	53	14.1 +	62.7	28.1	0.31	81.7	12.3 +	61.7 +2
0002	RRI//C82020/OK820377	D8931.15	HRW	58.0	54	12.8	61.7 -	26.5	0.36 -2	78.0 -2	10.9	54.7
0003	RRI/C82021/NE820658	D8932.46	HRW	56.4 -	51	11.3	65.5 +	31.6	0.31	84.6	9.9	55.2
0004	RRI//N7301004/CERCO	D8934.04	HRW	56.8 -	56	15.6 +2	61.1 -2	26.1	0.32	79.5 -	12.9 +	55.5
0005	PULLMAN AC	HW891101	HRW	57.6	62	11.0	61.1 -2	29.1	0.27 +	82.1	9.1	55.7
0006	PULLMAN AC	HW891102	HRW	57.3	58	11.6	60.3 -2	28.1	0.27 +	81.3	9.7	55.9
0007	PULLMAN AC	HW891103	SRW	57.2	48	11.7	63.0	28.8	0.28 +	83.5	9.6	54.7
0008	PULLMAN AC	HW891171	HRW	56.9 -	56	12.8	63.2	30.5	0.24 +2	85.9 +	10.3	55.8
0009	PULLMAN AC HW	HW891781	HW	56.0 -	57	12.3	59.8 -2	32.7	0.27 +	80.7 -	9.9	54.8
0010	PULLMAN AC	HW891782	HW	56.2 -	51	13.5	58.7 -2	29.7	0.27 +	79.6 -	10.8	56.4
*0011	HATTON	C1017772	HRW	58.7	64	12.2	63.6	32.3	0.30	83.1	10.3	54.4
0012	N8203105/N8106201	WA007679	HW	56.3 -	60	12.8	62.9	31.8	0.31	81.9	10.8	53.9

* = standard mean nursery flour protein = 10.5 mill used = Quad

Standard Mean	58.7	64	12.2	63.6	32.3	0.30	83.1	10.3	54.4
Nursery Mean	57.1	57	12.7	62.4	29.0	0.30	82.0	10.7	56.1
Nursery Standard deviation	1.06	4.4	1.54	1.69	2.27	0.037	2.56	1.31	2.32
Standard Mean	58.7	64	12.2	63.6	32.3	0.30	83.1	10.3	54.4
Nursery Mean	57.2	48	11.7	63.0	28.8	0.28	83.5	9.6	54.7
Standard Mean	58.7	64	12.2	63.6	32.3	0.30	83.1	10.3	54.4
Nursery Mean	56.2	56	12.9	60.5	31.4	0.28	80.7	10.5	55.0
Nursery Standard deviation	0.15	4.6	0.60	2.18	1.54	0.023	1.15	0.52	1.27

SAMPLE#	BREEDER#	MTYPE	BABS	MTIME	LVOL	BCRGR	PROQ	RVA	COLOR*
0001	D8931.14	1H	67.9 +2	1.5	800	8	-1		
0002	D8931.15	1M	58.9	1.3	770	8	-1		
0003	D8932.46	3M	57.4	2.3	760	6	0		
0004	D8934.04	1H	60.7	1.5	895 +2	5	-1		
0005	HW891101	6M	60.9	4.1 +	750	8	0		
0006	HW891102	5M	61.4	4.9 +2	750	6	0		
0007	HW891103	5M	60.2	3.7 +	745 -	8	0		
0008	HW891171	3H	61.3	2.8	835 +	6	+1		
0009	HW891781	6M	60.3	4.1 +	925 +2	5	+1	245	Q
0010	HW891782	2H	61.6	3.1	775	6	-1	246	U
*0011	C1017772	2H	59.6	1.9	790	6	0		
0012	WA007679	2H	58.6	1.9	790	6	-1	208	S

* = standard mean nursery flour protein = 10.5 mill used = Quad

HRW	59.6	1.9	790	6
HRW	61.0	2.5	794	7
HRW	3.10	1.32	50.1	1.2
HRW	59.6	1.9	790	6
SRW	60.2	3.7	745	8
HRW	59.6	1.9	790	6
HW	60.2	3.0	830	6
HW	1.50	1.10	82.6	0.6
				233
				21.7

COMMENTS: Quality parameters of HRW and HW selections in this nursery were graded by comparison to the standard mean of Hatton. Sample #920007 had NIR wheat hardness value of 48 and was classified as SRW, however, most selections had NIR wheat hardness between 50 and 60. Several lines had flour yield significantly less than that of the standard mean of Hatton. A few lines had comparable flour yield. Some lines had flour yield significantly less than Hatton, however, they had low flour ash content and their milling score was generally comparable to Hatton. Mixogram absorption (MABS) was quite low for nearly all selections (only partially due to low flour protein). Mixograms of most selections were typed as 1-2H and 3-6M, which show most with short mixing time and/or weak dough mixing properties. Sample #'s 920004 and 920009 had loaf volume significantly higher than that of Hatton and crumb grain score was judged slightly better. Loaf volume of some selections was equal to or significantly higher than that expected for their flour protein content, as graded by their protein quality (PROQ) rating. The mean nursery flour protein content was 10.5% and, at this level, one should expect loaf volume to be near 820 cc if the protein is of good quality. Rapid Visco Analyzer (RVA) viscosity was determined on all HW lines. RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable. Alkaline flour color (COLOR) was scored on all HW lines. *Color represents an extremely important quality criterion in Asian types of noodles. A preliminary alkaline flour color test was initiated. An alkaline Pekar slick was used to subjectively measure flour color. The Pekar slick was prepared by pressing flour to a smooth surface, immersing in a 1.0% alkaline solution consisting of 60% K₂CO₃ and 40% Na₂CO₃ for 2 minutes. The sample rested at a room temperature of (77°F) for 4 hours before visual observation and scoring. Flours were scored by the following; S = satisfactory, Q = questionable, and U = unsatisfactory. Desirable flour color ranges from bright white through creamy yellow to bright yellow. Any dullness, brown, or greenish casts would be unacceptable. Alkaline flour color (COLOR) is scored only on SWW, HWW, SWS and HWS wheats which have a minimum RVA viscosity of 150 and a minimum NIR wheat hardness (UWHRD) value of 40.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
*0001	MORO	C1013740	CLUB	57.1	28	10.1	64.4	40.9	0.41	77.0	8.4	50.4
0002	-----	REACLU81	CLUB	56.4	25	12.3 -	64.2	36.2	0.38 +	78.7	10.0	53.7 -
0003	-----	REACLU82	CLUB	58.0	21	8.9 +	64.1	39.9	0.39	77.9	8.3	49.0
0004	-----	REACLU83	CLUB	58.8	28	11.5	57.8 -2	35.7	0.40	69.2 -2	9.3	50.0
0005	-----	REACLU84	CLUB	60.1 +	14	10.7	59.1 -2	34.4	0.33 +2	75.3 -	9.0	52.9 -
0006	-----	REACLU85	CLUB	59.8 +	19	9.5	59.8 -2	35.4	0.31 +2	77.5	8.2	52.9 -
0007	-----	REACLU86	CLUB	59.6 +	36	11.5	65.2	36.8	0.36 +	81.2 +	9.1	51.4
0008	-----	REACLU87	CLUB	59.4 +	23	11.7	64.5	35.1	0.40	77.8	9.3	52.8 -
0009	-----	REACLU88	CLUB	57.9	25	11.6	60.9 -2	37.5	0.44 -	70.6 -2	9.2	52.7 -
0010	-----	VB091028	CLUB	57.8	27	9.8	66.4 +	40.1	0.41	79.6	8.3	51.2
0011	-----	VH091232	CLUB	58.8	62	12.0	63.4 -	29.7	0.44 -	73.8 -	9.7	54.6 -2
0012	-----	VH091538	CLUB	57.3	15	9.9	62.3 -2	36.0	0.42	73.7 -2	8.8	52.3 -
0013	N862505/JCM/C rog/WA6910	H9109601	CLUB	59.0	29	10.8	64.4	34.4	0.40	77.6	9.6	52.6 -
0014	N862505/JCM/C rog/WA6910	H9109602	CLUB	60.9 +	44	11.0	64.8	32.0	0.40	78.2	9.1	51.4
0015	N862505/JCM/C rog/WA6910	H9109605	CLUB	59.0	35	12.5 -	63.0 -	33.3	0.38 +	77.1	10.0	53.6 -
0016	N862505/JCM/C rog/WA6910	H9109607	CLUB	61.0 +	32	11.0	62.9 -	32.3	0.42	74.5 -	9.3	52.6 -
0017	N862505/JCM/C rog/WA6910	H9109608	CLUB	59.3	32	11.2	64.2	32.9	0.39	78.0	9.3	52.4 -
0018	JCM/SPN/TRES//N8600503	H9109701	CLUB	59.2	23	9.9	65.6	36.4	0.43 -	77.3	8.7	47.7
0019	JCM/SPN/TRES//N8600503	H9109702	CLUB	59.3	27	10.5	64.0	36.8	0.43 -	75.2 -	8.6	47.4
0020	JCM/SPN/TRES//N8600503	H9109703	CLUB	59.6 +	28	10.7	66.8 +2	40.1	0.38 +	82.0 +	8.8	47.4
0021	JCM/SPN/TRES//N8600503	H9109704	CLUB	58.9	28	10.1	64.0	37.2	0.41	76.5	8.3	46.7
0022	JCM/SPN/TRES//N8600503	H9109705	CLUB	58.3	18	10.1	65.2	38.1	0.38 +	79.9	8.6	46.7
0023	JCM/SPN/TRES//N8600503	H9109706	CLUB	57.9	33	11.4	66.0 +	40.1	0.39	80.3 +	9.1	47.7
0024	JCM/SPN/TRES//N8600503	H9109707	CLUB	59.1	32	12.0	61.0 -2	33.3	0.37 +	75.2 -	9.5	47.7
0025	JCM/SPN/TRES//N8605601	H9109803	CLUB	60.2 +	33	11.7	61.5 -2	32.8	0.37 +	75.9	9.4	47.6
0026	JCM/SPN/TRES//N8605601	H9109804	CLUB	60.1 +	27	10.0	58.3 -2	28.5	0.36 +	72.4 -2	9.3	47.3
0027	JCM/SPN/TRES//N8605601	H9109808	CLUB	59.7 +	26	11.5	59.2 -2	31.0	0.36 +	73.6 -2	9.5	47.0
*0028	TRES	C1017917	CLUB	58.3	23	11.3	64.8	36.4	0.39	78.8	9.2	47.2

* = standard mean nursery flour protein = 9.1 mill used = Quad

Standard Mean

Nursery Mean

Nursery Standard deviation

CLUB	57.7	26	10.7	64.6	38.7	0.40	77.9	8.8	48.8
CLUB	59.0	28	10.9	63.1	35.5	0.39	76.6	9.1	50.2
CLUB	1.10	9.3	0.91	2.51	3.24	0.031	3.03	0.51	2.65

SAMPLE#	BREEDER#	MTYPE	COOI	TGS
*0001	C1013740	2M	9.35	8
0002	REACLU81	3M	8.84 -2	7 -
0003	REACLU82	2L	9.04 -	8
0004	REACLU83	2M	8.89 -2	7 -
0005	REACLU84	3M	8.96 -2	7 -
0006	REACLU85	3M	8.99 -	8
0007	REACLU86	1M	9.16 -	7 -
0008	REACLU87	1M	9.23	8
0009	REACLU88	2M	9.16 -	7 -
0010	VB091028	5L	9.18 -	8
0011	VH091232	4M	8.16 -2	6 -2
0012	VH091538	4L	8.66 -2	7 -
0013	H9109601	2M	8.99 -	8
0014	H9109602	2M	8.75 -2	7 -
0015	H9109605	2M	8.73 -2	7 -
0016	H9109607	2M	8.90 -2	8
0017	H9109608	3M	9.19 -	8
0018	H9109701	1L	8.86 -2	7 -
0019	H9109702	2M	9.07 -	7 -
0020	H9109703	2M	9.55	9
0021	H9109704	2L	9.09 -	7 -
0022	H9109705	2L	9.24	7 -
0023	H9109706	2M	9.36	8
0024	H9109707	1M	9.19 -	7 -
0025	H9109803	2M	9.10 -	7 -
0026	H9109804	1M	9.05 -	8
0027	H9109808	2M	9.34	8
*0028	C1017917	1M	9.61	9

* = standard mean nursery flour protein = 9.1 mill used = Quad

CLUB	9.48	8
CLUB	9.06	8
CLUB	0.290	0.7

COMMENTS: Quality parameters of CLUB selections in this nursery were graded by comparison to the standard mean of Moro and Tres. Cookies were baked on all lines.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0001	85HR5933 87-1034 85HR6537	1	CLUB	60.0	27	8.0	73.7	51.9	0.42	88.2	6.6	50.1
0002	85HR5710 85HR6537 85HR5933	2	CLUB	61.0	29	8.9 -	72.0 -	48.7	0.39 +	88.0	7.1	52.4
0003	87-1060 87-1072 87-955	3	CLUB	59.9	21	8.2	72.5 -	51.0	0.38 +	89.2	7.0	52.3
*0004	TRES	23	CLUB	60.6	22	7.3	73.9	51.9	0.42	88.5	6.5	49.9
0005	H85A211 H85A244 85HR5639	30	CLUB	59.3	20	8.6	72.4 -	51.9	0.38 +	89.1	7.2	52.4

* = standard mean nursery flour protein = 6.9 mill used = Quad

Standard Mean

Nursery Mean

Nursery Standard deviation

6.5
51.4
1.30

SAMPLE# BREEDER# MTYPE CODI TGS CAVOL SCSOR

0001	1	1L	8.86	7	1310	76
0002	2	2L	8.90	7	1265	73
0003	3	1L	8.90	7	1280	75
*0004	23	1L	8.88	7	1280	75
0005	30	3L	9.15 +	8	1300	77

* = standard mean nursery flour protein = 6.9 mill used = Quad

CLUB		8.88	7	1280	75
CLUB		8.94	7	1287	75
CLUB		0.120	0.4	17.9	1.5

COMMENTS: Quality parameters of CLUB selections in this nursery were graded by comparison to the standard mean of Tres. Cookies and Japanese sponge cakes were baked on all lines.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0001	87-991 87-1034 87-1170	4	CLUB	58.3	37	8.1	72.1	16.8	0.33	82.1	6.9	51.8
0002	87-1260 85HR5326 85HR5350	6	CLUB	57.0	25	8.3	71.8	16.8	0.35	80.8 -	6.9	50.7
0003	86-315 85HR5326 85HR5350	7	CLUB	56.1 -	27	8.1	72.2	16.8	0.38 -	80.1 -	6.6	50.1
0004	87-991 85HR5326 85HR5350	9	CLUB	56.3 -	38	8.6	72.3	16.6	0.35	82.9	6.8	49.7
0005	85HR5510 85HR5326 85HR5350	10	CLUB	56.9	14	7.5	69.7 -	16.3	0.35	80.3 -	6.4	50.1
0006	85HR5333 H85A211 87-1260	16	CLUB	57.1	20	7.9	71.6	16.6	0.34	84.2 +	6.4	49.9
0007	85HR5333 85A74-36 85HR6806	17	CLUB	57.4	22	8.3	70.6	16.2	0.34	80.8 -	6.1	50.2
0008	85HR5494 85HR6537 85HR6806	18	CLUB	59.5	22	8.8	69.3 -	15.3	0.32 +	80.9	6.8	50.6
0009	HYAK-OR855	21	CLUB	58.6	25	8.4	69.6 -	14.8	0.33	81.1	6.3	51.8
*0010	TRES	23	CLUB	58.5	16	7.2	70.8	17.1	0.33	83.4	5.4	50.4
*0011	PAHA	24	CLUB	57.8	34	7.9	72.0	15.3	0.37	80.6	6.0	50.7

* = standard mean nursery flour protein = 6.4 mill used = Buhler

Standard Mean	CLUB	58.2	27	7.5	71.4	16.2	0.35	82.0	5.7	50.5
Nursery Mean	CLUB	57.6	26	8.1	71.1	16.2	0.34	81.6	6.4	50.5
Nursery Standard deviation	CLUB	1.05	8.5	0.46	1.14	0.76	0.018	1.37	0.46	0.70

SAMPLE#	BREEDER#	MTYPE	CODI	TGS	CAVOL	SCSCOR
0001	4	2L	8.80	6	1350	11
0002	6	3L	8.60	6	1310	76
0003	7	3L	8.79	7	1300	75
0004	9	3L	8.73	6	1375	77
0005	10	2L	8.76	7	1350	79
0006	16	1L	8.60	7	1330	78
0007	17	2L	8.94 +	6	1325	78
0008	18	2L	8.40	7	1300	75
0009	21	2L	8.49	7	1270 -	75
*0010	23	1L	8.55	7	1325	79
*0011	24	1L	8.54	7	1350	80

* = standard mean nursery flour protein = 6.4 mill used = Buhler

CLUB	8.55	7	1338	80
CLUB	8.65	7	1326	78
CLUB	0.161	0.5	29.8	2.1

COMMENTS: Quality parameters of CLUB selections in this nursery were graded by comparison to the standard mean of Tres and Paha. Cookies and Japanese sponge cakes were baked on all lines.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0001	85HR5933 87-1034 85HR6537	1	CLUB	59.0	24	8.9	73.0	52.0	0.43 -	86.7	7.6	50.9
0002	85HR5710 85HR6537 85HR5933	2	CLUB	60.3	18	8.6	72.9	51.4	0.40	88.5	7.0	50.4
0003	87-1060 87-1072 87-955	3	CLUB	60.8	23	7.3	72.5	51.8	0.37 +	89.9	5.9	52.4 -
*0004	TRES	23	CLUB	59.2	24	8.2	73.0	52.8	0.41	88.0	6.3	49.6
0005	H85A211 H85A244 85HR5639	30	CLUB	60.0	25	8.8	72.0	51.2	0.37 +	89.2	7.4	50.8

* = standard mean nursery flour protein = 6.8 mill used = Quad

Standard Mean	CLUB	59.2	24	8.2	73.0	52.8	0.41	88.0	6.3	49.6
Nursery Mean	CLUB	59.9	23	8.4	72.7	51.8	0.40	88.5	6.8	50.8
Nursery Standard deviation	CLUB	0.75	2.8	0.65	0.43	0.62	0.026	1.22	0.72	1.02

SAMPLE#	BREEDER#	MTYPE	CODI	TGS	CAVOL	SCSCOR
0001	1	2L	9.15 +	7	1330	76
0002	2	3L	8.82	7	1285 -	74
0003	3	1L	8.96	7	1320	75
*0004	23	1L	8.88	6	1345	79
0005	30	3L	9.19 +	7	1225 -2	69 -

* = standard mean nursery flour protein = 6.8 mill used = Quad

CLUB	8.88	6	1345	79
CLUB	9.00	7	1301	75
CLUB	0.164	0.4	47.9	3.6

COMMENTS: Quality parameters of CLUB selections in this nursery were graded by comparison to the standard mean of Tres. Cookies and Japanese sponge cakes were baked on all lines.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0001	87-991 87-1034 87-1170	4	CLUB	58.0	11	7.5	71.0 -	17.7	0.36 +	79.3	6.5	50.9
0002	87-1260 85HR5326 85HR5350	6	CLUB	56.4	9	7.9	71.5	17.6	0.39	78.5 -	6.1	49.7
0003	96-315 85HR5326 85HR5350	7	CLUB	56.8	11	7.6	71.1 -	18.2	0.39	78.0 -	5.9	50.3
0004	87-991 85HR5326 85HR5350	9	CLUB	56.2	7	6.7	72.3	21.1	0.39	81.2 +	5.5	49.4
0005	85HR5510 85HR5326 85HR5350	10	CLUB	55.0 -	19	7.7	71.3	18.8	0.43 -	78.3 -	5.9	48.9
0006	85HR5333 85A74-36 85HR6806	16	CLUB	56.7	11	7.7	72.8	19.4	0.39	79.9	6.1	50.1
0007	85HR5333 85A74-36 85HR6806	17	CLUB	57.2	10	7.7	70.9 -	17.5	0.37 +	78.6 -	6.2	49.0
0008	85HR5494 85HR6537 85HR6806	18	CLUB	58.2	16	7.7	71.5	17.4	0.35 +2	81.2 +	6.2	49.8
0009	HYAK-OR855	21	CLUB	58.5	17	6.7	70.9 -	18.8	0.37 +	80.1	5.1	51.9 -
*0010	TRES	23	CLUB	57.8	12	8.0	71.3	18.1	0.39	78.8	6.0	48.7
*0011	PAHA	24	CLUB	57.2	19	6.9	73.2	19.1	0.40	81.0	5.6	49.3

* = standard mean nursery flour protein = 5.9 mill used = Buhler

Standard Mean

Nursery Mean

Nursery Standard deviation

SAMPLE#	BREEDER#	MTYPE	COOI	TGS	CAVOL	SCSCOR
0001	4	2L	8.65 -	6	1310	76
0002	6	4L	8.43 -2	6	1300	74
0003	7	2L	8.62 -	6	1315	76
0004	9	1L	8.60 -	6	1315	79
0005	10	1L	8.68 -	4 -2	1265 -	74
0006	16	1L	8.85	7	1290 -	76
0007	17	1L	9.06	7	1330	78
0008	18	1L	8.64 -	7	1295 -	76
0009	21	1L	8.70 -	7	1315	76
*0010	23	1L	8.90	7	1325	76
*0011	24	1L	9.21	7	1355	81

* = standard mean nursery flour protein = 5.9 mill used = Buhler

CLUB	9.05	7	1340	78
CLUB	8.76	6	1310	77
CLUB	0.226	0.9	23.4	2.1

COMMENTIS: Quality parameters of CLUB selections in this nursery were graded by comparison to the standard mean of Tres and Paha. Cookies and Japanese sponge cakes were baked on all lines.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0001	SEL-1	41	HRW	63.2 +	58	13.8	62.5 -	28.4	0.35	79.4	11.9	57.4 -2
0002	SEL-2	42	HRW	63.1 +	56	13.5	61.5 -2	29.0	0.31 +2	80.4	12.2	62.0
0003	INC9	43	HRW	63.2 +	73	13.1	65.8 +	30.4	0.32 +2	84.4 +2	12.0	61.8
0004	89002-3	101	HRW	57.4 -2	62	14.0	61.1 -2	29.6	0.42 -2	74.3 -2	12.4	62.5
0005	F6TROY-30/19	102	HRW	57.3 -2	61	13.5	61.0 -2	29.3	0.44 -2	73.1 -2	12.3	62.5
*0006	WESTON	103	HRW	61.2	55	13.2	63.8	30.0	0.36	80.2	12.0	63.0

* = standard mean nursery flour protein = 12.1 mill used = Quad

Standard Mean
Nursery Mean
Nursery Standard deviation

	HRW	61.2	55	13.2	63.8	30.0	0.36	80.2	12.0	63.0
	HRW	60.9	61	13.5	62.6	29.4	0.37	78.6	12.1	61.5
	HRW	2.85	6.6	0.34	1.88	0.71	0.053	4.21	0.20	2.07

SAMPLE#	BREEDER#	MTYPE	BABS	MTIME	LVOL	BCRGR	PROQ
0001	41	2H	60.6 -	1.5	900 -	5	0
0002	42	2H	65.2	1.5	905 -	5	-1
0003	43	2H	64.0	1.9	915 -	4	0
0004	101	2H	64.7	2.0	920 -	6	-1
0005	102	2H	64.7	2.0	955	5	0
*0006	103	2H	65.2	2.2	970	3	+1

* = standard mean nursery flour protein = 12.1 mill used = Quad

HRW
HRW
HRW

65.2 2.2 970 3
64.1 1.8 928 5
1.75 0.29 28.4 1.0

COMMENTS: Quality parameters of HRW selections in this nursery were graded by comparison to the standard mean of Weston. Breeder #'s 41, 42 and 43 were submitted from the 1991 crop and Breeder #'s 101, 102 and 103 were submitted from the 1992 crop. Caution in the interpretation of the quality parameter data of the 1991 crop lines by comparison to Weston from the 1992 crop is required. The wheat and flour protein content of all lines is quite satisfactory for bread-type wheats. Flour yield of most lines was significantly less than that of Weston. Breeder #43 had an exceptionally good flour yield and milling score. Lower flour ash content contributed to higher milling score for some lines. Water absorption measured by mixogram (MABS) or by bake absorption (BABS) was low (poor) for Breeder #41. Bake mixing time (MTIME) of all lines, including Weston, is considered too short for bread-type wheats. Desirable mixing time would be a minimum of 3 minutes with preference around 4-5 minutes. All lines except Breeder #102 had loaf volume significantly less than that of Weston. Breeder #102 had comparable loaf volume. All Breeder #'s 42 and 101 had loaf volume significantly less than that expected for their flour protein content as graded by their protein quality (PROQ) rating. All other lines had volume equal to that expected for their flour protein content. The mean nursery flour protein content was 12.1% and at this level one should expect a loaf volume near 925cc if the protein is of good quality. Bread crumb grain score of all lines was judged to be somewhat less than that of Weston.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	HABS
*0001	PENAWAWA	S41	SWS	60.3	16	12.2	68.6	16.4	0.35	75.2	10.0	54.1
0002	WADUAL	S42	SWS	61.0	24	11.9	72.9 +2	16.3	0.30 +2	86.9 +2	10.6	56.8 -
*0003	SPILLMAN	S43	HRS	59.1	80	14.5	67.5	10.3	0.33	76.1	12.8	61.4
0004	DAWS*2/TRIPLE DIRK B VRN2//2*DAWS (W)	S44	SWS	57.6 -	31	12.0	69.9 +	17.6	0.34	78.6 +	9.7	53.4
0005	BRB*2/TRIPLE DIRK D VRN1//2*BRB (W)	S45	SWS	57.0 -	21	10.7	72.4 +2	20.3	0.36	80.7 +2	9.9	52.4
0006	BRB*2/TRIPLE DIRK D VRN1//2*BRB (W)	S46	SWS	55.9 -2	20	11.5	67.7	20.6	0.38 -	75.7	10.6	52.3
0007	BRB*2/TRIPLE DIRK D VRN1//2*BRB (W)	S47	SWS	57.3 -	31	12.3	72.3 +2	21.3	0.32 +	82.8 +2	10.2	51.8
0008	BRB*2/TRIPLE DIRK F//2*BRB (W)	S48	SWS	60.1	24	10.9	69.7	19.6	0.36	75.5	9.8	51.8
0009	BVR*3/TRIPLE DIRK D VRN1 (W)//BVR	S49	HRS	61.2 +	58	12.4 -	65.2 -2	12.7	0.36 -	72.0 -	10.4 -	57.6 -
0010	BVR*3/TRIPLE DIRK D VRN1 (W)//BVR	S50	SRS	60.3	26	11.3	68.2	19.5	0.35	76.0	9.4	54.7
0011	BVR*2/TRIPLE DIRK E VRN3//2*BVR (W)	S51	HRS	61.7 +	50	13.4	65.8 -	13.6	0.33	74.5	11.2 -	56.8 -
0012	BURT*2/TRIPLE DIRK F//2*BURT (W)	S52	HRS	60.4	55	13.1	62.6 -2	14.2	0.36 -	67.1 -2	10.9 -	57.6 -
0013	BURT*2/TRIPLE DIRK F//2*BURT (W)	S53	HRS	60.3	84	12.0 -	61.0 -2	9.0	0.42 -2	64.1 -2	11.0 -	59.0
0014	BURT*2/TRIPLE DIRK F//2*BURT (W)	S54	HRS	61.6 +	71	12.3 -	63.1 -2	10.5	0.38 -2	68.9 -2	11.0 -	60.0
0015	DAWS*2/TRIPLE DIRK D VRN1//2*DAWS (W)	S55	SRS	59.0	22	11.1	61.8 -2	13.9	0.36	62.9 -2	9.9	56.5
0016	NGN*2/TRIPLE DIRK B VRN2//2*NGN (W)	S56	SRS	59.6	10	11.4	69.3	17.6	0.33	76.4	9.9	54.6
0017	NGN*2/TRIPLE DIRK D VRN1//2*NGN (W)	S57	SRS	60.6	41	10.6 +	69.0	13.5	0.34	77.0	9.8	54.4
0018	NGN*2/TRIPLE DIRK E VRN3//2*NGN (W)	S58	SRS	60.3	28	10.6 +	67.0 -	14.4	0.34	75.5	9.6	55.7
0019	NGN*2/TRIPLE DIRK F//2*NGN (W)	S59	SRS	59.0	23	11.3	68.2	15.9	0.34	75.9	10.0	56.8 -
0020	NGN*2/TRIPLE DIRK F//2*NGN (W)	S60	SRS	60.6	29	11.8	66.8 -	13.1	0.35	74.8	10.7	57.6 -
0021	SPN*2/TRIPLE DIRK F//2*SPN (W)	S61	SRS	57.8 -	22	10.4 +	69.5	15.3	0.35	76.4	9.9	55.4
0022	SPN*2/TRIPLE DIRK F//2*SPN (W)	S62	SRS	59.2	25	11.5	69.3	14.0	0.36	77.5 +	10.4	54.4
0023	WNS*2/TRIPLE DIRK D VRN1//2*WNS (R)	S63	HRS	61.0 +	91	13.5	67.4	10.0	0.34	76.9	11.6	58.1 -
0024	WNS*2/TRIPLE DIRK D VRN1//2*WNS (R)	S64	HRS	60.7	74	14.9	66.9	10.5	0.34	77.0	12.5	58.4 -
0025	WNS*2/TRIPLE DIRK E VRN3//2*WNS (R)	S65	HRS	61.3 +	72	14.4	65.3 -	9.9	0.34	74.4	12.2	60.1
0026	WNS*2/TRIPLE DIRK F//2*WNS (R)	S66	HRS	61.9 +	74	14.6	67.5	9.7	0.34	78.7 +	12.2	60.1
0027	WNS*2/TRIPLE DIRK F//2*WNS (R)	S67	HRS	61.8 +	76	14.7	67.2	10.5	0.35	78.2	12.3	60.4
0028	PAHA*2/TRIPLE DIRK B VRN2//2*PAHA (W)	S68	SWS	59.2	33	11.0	74.8 +2	15.5	0.38 -	86.3 +2	10.4	52.4
0029	PAHA*2/TRIPLE DIRK B VRN2//2*PAHA (W)	S69	SWS	59.3	45	12.2	68.6	12.9	0.37 -	77.2	11.1	53.7
0030	TRES//OMAR/T. DIRK B VRN2//2*TRES (W)	S70	SWS	55.5 -2	29	10.9	70.4 +	15.0	0.40 -2	74.7	10.0	51.1 +
0031	TRES//OMAR/T. DIRK B VRN2//2*TRES (W)	S71	SWS	57.1 -	21	11.4	71.7 +2	14.4	0.41 -2	76.6	10.1	50.7 +
0032	TYEE*2/TRIPLE DIRK E VRN3//2*TYEE (W)	S72	SWS	56.7 -2	30	10.6 +	68.6	14.6	0.33	77.8 +	9.9	52.1
0033	TYEE*2/TRIPLE DIRK E VRN3//2*TYEE (W)	S73	SWS	55.6 -2	30	10.5 +	69.6	15.4	0.34	78.1 +	9.8	52.0
0034	TYEE*2/TRIPLE DIRK E VRN3//2*TYEE (W)	S74	SWS	58.6 -	35	9.0 +2	70.9 +2	15.4	0.31 +	81.8 +2	9.9	53.0
0035	TYEE*2/TRIPLE DIRK E VRN3//2*TYEE (W)	S75	SWS	58.8	30	10.0 +	70.2 +	15.0	0.31 +	81.2 +2	10.2	52.8

* = standard mean nursery flour protein = 10.5 mill used = Buhter

SAMPLE#	BREEDER#	MTYPE	COOI	TGS	CAVOL	SCSCOR	BABS	MTIME	LVOL	BCRGR	PROQ	RVA
*0001	S41	4M	8.66	6	1145	63						219
0002	S42	5M	8.32 -	6			59.0	4.0	855 +2	5	+1	209
*0003	S43	4M	7.38	1			65.6	3.5	930	4	-1	177
0004	S44	3M	8.11 -2	5	1280 +2	72 +						150
0005	S45	2M	8.38 -	5	1265 +2	73 +						149
0006	S46	1M	8.39 -	4 -	1315 +2	75 +2						154
0007	S47	1M	8.60	5	1335 +2	74 +2						183
0008	S48	2M	8.65	6	1325 +2	76 +2						177
0009	S49	2M	7.85	3 +	1195	67						173
0010	S50	2M	8.98 +	6	1340 +2	77 +2						189
0011	S51	2H	8.00	2	1160	64						194
0012	S52	3H	7.90	1			61.8 -	3.0	880 -	3	+1	203
0013	S53	4H	7.52	1			64.2	3.6	850 -	4	0	191
0014	S54	4H	7.47	2			66.2	3.7	865 -	5	0	213
0015	S55	5M	8.02 -2	3 -2	1295 +2	75 +2						199
0016	S56	1M	8.43	6	1280 +2	75 +2						210
0017	S57	2H	7.76 -2	4 -	1075 -	57 -						155
0018	S58	3H	7.59 -2	5	1165	66						211
0019	S59	2M	8.23 -	6	1225 +	71 +						182
0020	S60	2H	7.74 -2	4 -	1185	66						177
0021	S61	3M	8.46	5	1210 +	71 +						159
0022	S62	2M	8.54	6	1245 +2	70 +						163
0023	S63	3H	7.46	3 +			63.3	2.9	835 -2	5	-1	166
0024	S64	3H	7.57	2			63.6	2.8	825 -2	5	-1	151
0025	S65	3H	7.26	1			65.3	2.8	895	5	-1	171
0026	S66	4H	7.39	1			65.3	2.6	860 -	4	-1	150
0027	S67	3H	7.49	0			66.6	2.4	855 -	5	-1	165
0028	S68	2M	8.76	7	1270 +2	71 +						166
0029	S69	1M	7.99 -2	5	1305 +2	71 +						131
0030	S70	1M	8.75	6	1275 +2	73 +						149
0031	S71	1M	8.71	5	1305 +2	71 +						138
0032	S72	2M	8.64	6	1325 +2	76 +2						165
0033	S73	3M	8.19 -	6	1300 +2	75 +2						164
0034	S74	3M	8.52	7	1280 +2	75 +2						156
0035	S75	3M	8.62	7	1325 +2	77 +2						163

* = standard mean nursery flour protein = 10.5 mill used = Buhler

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0036	TYEE*2/TRIPLE DIRK E VRN3//2*TYEE (W)	S76	SWS	58.8	29	11.4	71.0 +2	16.0	0.31 +	82.1 +2	9.9	52.8
0037	TYEE*2/TRIPLE DIRK F//2*TYEE (W)	S77	SWS	55.8 -2	37	10.4 +	71.9 +2	18.9	0.37 -	80.1 +2	9.2	52.9
0038	TYEE*2/TRIPLE DIRK F//2*TYEE (W)	S78	SWS	59.6	27	11.6	72.3 +2	18.1	0.32 +	82.4 +2	10.2	53.8
0039	TYEE*2/TRIPLE DIRK F//2*TYEE (W)	S79	HWS	58.5	64	12.0 -	71.6 +2	13.7	0.35	83.7 +2	10.1 -	54.4 -2
0040	TYEE*2/TRIPLE DIRK F//2*TYEE (W)	S80	SWS	58.8	36	11.5	73.0 +2	15.5	0.33	87.3 +2	10.2	53.9

* = standard mean nursery flour protein = 10.5 mill used = Buhler

Standard Mean	SWS	60.3	16	12.2	68.6	16.4	0.35	75.2	10.0	54.1
Nursery Mean	SWS	58.1	29	11.2	70.9	16.8	0.35	80.1	10.1	52.8
Nursery Standard deviation	SWS	1.70	6.9	0.85	1.86	2.38	0.032	3.97	0.41	1.34
Standard Mean	HRS	59.1	80	14.5	67.5	10.3	0.33	76.1	12.8	61.4
Nursery Mean	HRS	61.0	71	13.6	65.4	11.0	0.35	73.4	11.6	59.0
Nursery Standard deviation	HRS	0.84	12.5	1.06	2.26	1.70	0.027	4.84	0.79	1.45
Standard Mean	SWS	60.3	16	12.2	68.6	16.4	0.35	75.2	10.0	54.1
Nursery Mean	SRS	59.6	25	11.1	67.7	15.2	0.35	74.7	10.0	55.6
Nursery Standard deviation	SRS	0.94	8.1	0.48	2.41	2.12	0.010	4.50	0.39	1.17
Standard Mean	HRS	59.1	80	14.5	67.5	10.3	0.33	76.1	12.8	61.4
Nursery Mean	HWS	58.5	64	12.0	71.6	13.7	0.35	83.7	10.1	54.4

SAMPLE#	BREEDER#	MTYPE	CODI	TGS	CAVOL	SCSCOR	BABS	MTIME	LVOL	BCRGR	PROQ	RVA
0036	S76	3M	8.55	7	1290 +2	73 +						162
0037	S77	3M	8.40 -	6	1260 +2	72 +						173
0038	S78	3M	8.49	6	1335 +2	77 +2						179
0039	S79	3M	8.09	5 +2	1225	68						159
0040	S80	2M	8.56	7	1300 +2	73 +						179

* = standard mean nursery flour protein = 10.5 mill used = Buhler

SWS	8.66	6	1145	63								219
SWS	8.49	6	1291	73			59.0	4.0	855	5		167
SWS	0.217	0.9	43.6	3.2								21.8
HRS	7.38	1					65.6	3.5	930	4		177
HRS	7.57	2	1178	66			64.7	3.0	866	4		178
HRS	0.238	0.9	24.7	2.1			1.55	0.46	32.0	0.7		20.4
SWS	8.66	6	1145	63								219
SRS	8.19	5	1224	70								183
SRS	0.455	1.1	78.6	6.1								21.2
HRS	7.38	1					65.6	3.5	930	4		177
HWS	8.09	5	1225	68								159

COMMENTS: Quality parameters of SWS and SRS selections were graded by comparison to the standard mean of Penawawa. Quality parameters of HRS and HWS lines were graded by comparison to the standard mean of Spillman. Breeder #1's 92S49 and 92S51 had NIR wheat hardness value equal to or greater than 50 and were classified as HRS. Breeder #2S79 had NIR wheat value greater than 50 and was classified as HWS. These three lines have soft wheat parentages, however, their wheat hardness value indicated they were possible hard wheats (bread types). Those lines with parentage of Burt (92S52 to 92S54) and Wanser (92S63 to 92S67) showed they were hard wheat (bread types). All other lines showed NIR wheat value less than 50 and were classified as SRS or SWS. Several lines had flour yield and/or milling score significantly better than that of their respective standard mean. Several lines were comparable to and a few lines had significantly less flour yield and/or milling score than their respective standard mean. Cookies were baked on all lines. Japanese sponge cakes were baked on those lines classified as SRS and SWS. Nearly all cakes had significantly higher cake volume and score than that of the standard mean of Penawawa. Bread was baked on those lines indicated as bread types (92S52 to 92S54 and 92S63 to 92S67). Nearly all lines classified as HRS or HWS had poor cookie spread and top grain score. Cookie diameter and top grain score of most soft lines were comparable to that of Penawawa. Loaf volume of nearly all lines which were bread baked was significantly less than that of Spillman. Loaf volume of four lines was equal to, or significantly higher than, that expected for their flour protein content as graded by their protein quality (PROQ) rating. The other lines had loaf volume significantly less than expected. The mean nursery flour protein content was 10.5% and at this level, one should expect a loaf volume near 825cc if the protein is of good quality. Bread crumb grain score of most lines was judged to be generally poorer than that of Spillman, with few exceptions.

Rapid Visco Analyzer (RVA) viscosity was determined on all lines. RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable.

SAMPLE#	VARIETY	BREEDER#	CLASS	LOCATION	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT
0001	WAKANZ		SWS	PULLMAN	57.7	26	10.9	67.1	39.7	0.33	85.5	9.0
0002	WA7176		SWS	PULLMAN	56.7	24	11.1	64.5	39.6	0.38	79.0	9.2
0003	HF927176		SWS	PULLMAN	57.6	20	11.2	64.6	40.0	0.37	79.8	9.0
0004	WAKANZ		SWS	R. SLOPE	56.6	21	11.8	68.0	43.9	0.35	85.4	8.9
0005	WA7176		SWS	R. SLOPE	57.5	17	11.6	65.1	43.4	0.40	78.5	8.9
0006	HF927176		SWS	R. SLOPE	57.8	18	11.1	65.0	43.7	0.39	79.0	8.6

* = standard mean nursery flour protein = 8.9 mill used = Quad

SAMPLE#	BREEDER#	MABS	MTYPE	CODI	TGS	CAVOL	SCSCOR	RVA
0001		53.9	2M	9.06	7	1175	64	207
0002		54.1	2M	9.46	8	1075	57	198
0003		53.4	2M	9.20	7	1090	57	208
0004		53.4	3M	9.11	8	1135	62	121
0005		53.4	2M	9.16	8	1210	67	123
0006		52.4	2M	9.01	7	1240	69	147

* = standard mean nursery flour protein = 8.9 mill used = Quad

COMMENTS: Wakanz, WA7176 and HF927176 were received from Pullman and Royal Slope, WA. Test weights of all lines were rather low (56.5-57.8 lbs/bu). Wakanz had significantly higher flour yield and milling score than the two selections from both locations. Flour protein content was nearly equal among all lines from each location. The cookie diameters of WA7176 and HF927176 were somewhat larger than Wakanz (Pullman location). There was not much difference in cookie diameter or top grain score among Wakanz and the two selections from Royal Slope. Sponge cake volume and score of Wakanz from Pullman was significantly higher than that of the two selections, however, sponge cake volume and score of Wakanz from Royal Slope was significantly less than the two selections. Sponge cakes of WA7176 and HF927176 from Pullman had sunken centers, indicating sprout damage. The Wakanz sponge cake from Royal Slope had a slightly sunken center, indicating some sprout damage.

SAMPLE#	VARIETY	BREEDER#	CLASS	NIRWPROT	UWHRD
0001	K87008	1	SWS	13.3	30
0002	K87015	2	HWS	12.8	86
0003	K87015	3	SWS	13.4	32
0004	K87025	4	SWS	11.5	26
0005	PENAWAWA	5	SWS	11.9	28
0006	K87025	6	SWS	10.8	25
0007	K87025	7	SWS	11.0	26
0008	K87025	8	SWS	12.0	24
0009	K87107	9	SWS	12.0	21
0010	K87107	10	SWS	12.3	27
0011	K87107	11	SWS	12.5	24
0012	K87111	12	SWS	13.0	36
0013	K87111	13	HWS	14.7	65
0014	K87111	14	SWS	14.5	45
0015	K87412	15	HWS	13.8	75
0016	K87469	16	SWS	12.8	33
0017	PENAWAWA	17	SWS	11.6	25
0018	K87497	18	SWS	12.4	28
0019	K87497	19	SWS	12.4	23
0020	K87702	20	SWS	11.8	28
0021	K87702	21	SWS	12.5	28
0022	K87708	22	SWS	12.3	27
0023	K87708	23	SWS	11.9	32
0024	K87708	24	SWS	12.3	29
0025	K87708	25	SWS	12.9	27
0026	K87711	26	SWS	12.3	23
0027	K87711	27	SWS	12.7	28
0028	K87711	28	SWS	13.1	27
0029	K87711	29	SWS	13.3	29
0030	K87711	30	SWS	12.9	29
0031	K87711	31	SWS	12.5	30
0032	K87711	32	SWS	12.0	27
0033	PENAWAWA	33	SWS	11.7	27
0034	K87711	34	SWS	12.6	30
0035	K87711	35	SWS	12.5	30
0036	K87711	36	SWS	12.7	28
0037	K87711	37	SWS	12.1	30
0038	K87715	38	SWS	12.2	28
0039	K87715	39	HWS	12.1	64
0040	K87715	40	HWS	12.1	71

SAMPLE#	VARIETY	BREEDER#	CLASS	NIRWPROT	UWHRD
0041	K87715	41	HWS	11.7	53
0042	K87718	42	SWS	11.9	26
0043	K87720	43	SWS	12.9	31
0044	PENAWAWA	44	SWS	12.5	23
0045	K87729	45	SWS	11.2	27
0046	K87729	46	SWS	12.9	24
0047	K87730	47	SWS	11.8	23
0048	K87737	48	SWS	12.6	22
0049	K87737	49	SWS	10.3	23
0050	K87738	50	SWS	11.7	41
0051	K87752	51	SWS	12.1	24
0052	K87752	52	SWS	12.1	33
0053	K87752	53	SWS	11.2	30
0054	K87752	54	SWS	12.7	29
0055	K87755	55	SWS	12.3	47
0056	K87755	56	SWS	12.5	27
0057	K87766	57	SWS	12.0	26
0058	K87766	58	SWS	12.3	24
0059	K87766	59	SWS	12.3	21
0060	K87766	60	SWS	12.2	23
0061	K87767	61	SWS	11.8	29
0062	PENAWAWA	62	SWS	11.7	22
0063	K87768	63	SWS	11.1	25
0064	K87768	64	SWS	11.6	28
0065	K87772	65	SWS	11.7	36

COMMENTS: This nursery was a portion of selections which were inadvertently not submitted for milling and baking quality tests in Nursco 67. Since no time was available to test mill and bake this portion before Spring planting decisions, only NIR wheat protein content and hardness analyses were done. The bulk of the lines were SWS. Breeder #'s 2, 13, 15, 39, 40 and 41 had NIR wheat hardness value greater than 50 and were classified as HWS.

SAMPLE#	VARIETY/BREEDER#	CLASS	TWT	UMHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS	MTYPE	CODI	TGS	VISC
0001	92-56	CLUB	54.5	32	15.4 -	60.0 -2	35.3	0.37	73.9 -2	12.8 -	55.3 -	1H	8.35 -2	6 -	31 +
0002	92-57	CLUB	54.4	30	13.8	63.2 -	43.9	0.33 +	80.6	11.3	54.6 -	1H	8.98	7	209 -2
0003	TRES	CLUB	55.5	22	11.6	64.4	40.4	0.36	80.2	9.3 +	50.5	1L	9.19	7	61
*0004	PAHA	CLUB	55.4	17	13.0	64.4	39.2	0.36	80.2	10.8	50.1	2M	9.07	8	106
0005	HYAK	CLUB	55.2	27	11.8	64.8	39.2	0.34 +	82.0	9.4 +	54.3 -	4M	8.77 -	8	168 -

* = standard mean nursery flour protein = 10.7 mill used = Quad

Standard Mean	CLUB	55.4	17	13.0	64.4	39.2	0.36	80.2	10.8	50.1	106
Nursery Mean	CLUB	55.0	26	13.1	63.4	39.6	0.35	79.4	10.7	53.0	115
Nursery Standard deviation	CLUB	0.51	6.1	1.56	1.97	3.08	0.016	3.15	1.45	2.46	73.7

COMMENTS: In a prior nursery (NURSCO 091) Advanced Clubs, Pullman Late, milling errors occurred on Breeder #'s 92-56 and 92-57. These two selections along with three check varieties were resubmitted for quality testing. Quality parameters were graded by comparison to the standard mean of Paha. Cookies were baked and Brookfield viscosity (VISC) were determined on all lines. Test weight of these lines were poor (nursery mean = 55 lbs/bu) and flour yield was low. Wheat protein content was very high (nursery mean = 13.1%). Quality parameter data of the resubmitted check varieties deviated considerably from those determined in Nursco 091. For example, flour yield ranged from 5-7% higher in Nursco 091. From this data, it is presumed that the resubmitted lines came from different plots.

SAMPLE#	VARIETY	BREEDER#	CLASS	UWHRD	WPROT*	DSI**	SAMPLE#	VARIETY	BREEDER#	CLASS	UWHRD	WPROT*	DSI**
0001	800184	202/50221	CLUB	29	11.6		0041	852482	202/51143	CLUB	30	12.5	
0002	800184	202/50220	CLUB	37	12.8		0042	852482	202/51146	CLUB	30	12.0	
0003	700118	202/50226	CLUB	20	13.1		0043	852482	202/51148	CLUB	26	12.1	
0004	700118	202/50227	CLUB	24	12.6		0044	852482	202/51159	CLUB	31	12.8	
0005	852477	202/51031	CLUB	34	12.8		0045	852482	202/51160	CLUB	33	13.2	
0006	852477	202/51032	CLUB	38	12.8		0046	852482	202/51161	CLUB	30	12.5	
0007	852477	202/51033	CLUB	23	12.6		0047	852482	202/51162	CLUB	33	12.5	
0008	852477	202/51034	CLUB	24	13.0		0048	852482	202/51174	CLUB	32	11.7	
0009	852478	202/51041	CLUB	28	12.5		0049	852482	202/51179	CLUB	31	12.8	
0010	852478	202/51043	CLUB	38	11.8		0050	852482	202/51182	CLUB	28	11.5	
0011	852478	202/51048	CLUB	26	12.4		0051	852486	202/51192	CLUB	33	11.1	
0012	852478	202/51051	CLUB	33	12.1		0052	852486	202/51193	CLUB	29	11.5	
0013	852478	202/51056	CLUB	34	12.3		0053	852486	202/51194	CLUB	29	12.0	
0014	852478	202/51058	CLUB				0054	852486	202/51198	CLUB	30	11.4	
0015	852478	202/51062	CLUB				0055	852486	202/51200	CLUB	28	11.9	
0016	852478	202/51072	CLUB	30	11.6		0056	852486	202/51205	CLUB	28	12.8	
0017	Omar	202/51075	CLUB	35	12.2	0.083	0057	852486	202/51210	CLUB	28	12.9	
0018	Tres	202/51077	CLUB	37	11.9	0.037	0058	852486	202/51219	CLUB	33	13.7	
0019	852479	202/51079	CLUB	24	11.9		0059	852486	202/51221	CLUB	37	13.6	
0020	852479	202/51082	CLUB	34	12.6		0060	852486	202/51231	CLUB	30	11.2	
0021	852479	202/51083	CLUB	25	12.8		0061	852486	202/51232	CLUB	29	11.5	
0022	852479	202/51085	CLUB	31	13.2		0062	852486	202/51233	CLUB	33	11.5	
0023	852479	202/51086	CLUB	32	13.5		0063	852893	202/51264	CLUB	37	12.5	
0024	852480	202/51089	CLUB	36	12.5		0064	852893	202/51265	CLUB	38	13.0	
0025	852480	202/51091	CLUB	36	12.1		0065	852893	202/51266	CLUB	40	13.1	
0026	852480	202/51092	CLUB	30	12.7		0066	Omar	202/51270	CLUB	42	13.9	0.035
0027	852480	202/51094	CLUB	41	12.5		0067	Tres	202/51271	CLUB	37	12.8	
0028	852480	202/51096	CLUB	30	12.5		0068	852893	202/51282	CLUB	33	13.2	
0029	852482	202/51108	CLUB	32	13.3		0069	852893	202/51283	CLUB	23	12.6	
0030	852482	202/51109	CLUB	40	13.4		0070	852893	202/51285	CLUB	25	12.4	
0031	852482	202/51112	CLUB	30	13.9		0071	852893	202/51286	CLUB	26	12.2	
0032	852482	202/51113	CLUB	29	13.4		0072	852893	202/51287	CLUB	26	13.0	
0033	852482	202/51124	CLUB	27	13.9		0073	861018	204/51319	CLUB	30	10.9	
0034	852482	202/51125	CLUB	27	14.2		0074	861018	204/51320	CLUB	27	11.1	
0035	852482	202/51131	CLUB	72	13.7		0075	861018	204/51324	CLUB			
0036	852482	202/51135	CLUB	29	12.2		0076	861018	204/51325	CLUB			
0037	852482	202/51139	CLUB	28	12.2		0077	861018	204/51326	CLUB			
0038	852482	202/51140	CLUB	29	12.3		0078	861018	204/51327	CLUB			
0039	852482	202/51141	CLUB	25	12.9		0079	861018	204/51328	CLUB			
0040	852482	202/51142	CLUB	29	12.6		0080	861018	204/51329	CLUB			

WPROT = Wheat grain protein UWHRD = NIR grain hardness DSI = Phadebas Amylase Test No data = Missing sample

* As is moisture basis

** DSI reading greater than 0.120 denotes sprout damage

SAMPLE#	VARIETY	BREEDER#	CLASS	UWHRD	WPROT*	DSI**	SAMPLE#	VARIETY	BREEDER#	CLASS	UWHRD	WPROT*	DSI**
0081	861018	204/51332	CLUB	24	10.3		0121	861018	204/51651	CLUB	30	11.2	
0082	861018	204/51342	CLUB	30	10.7		0122	861018	204/51652	CLUB	30	10.6	
0083	861018	204/51343	CLUB	27	10.8		0123	861018	204/51653	CLUB	29	11.1	
0084	861018	204/51344	CLUB	27	11.4		0124	861018	204/51654	CLUB	31	12.5	
0085	861018	204/51354	CLUB	42	11.5		0125	861018	204/51656	CLUB	29	11.3	
0086	Omar	204/51357	CLUB	33	12.2	0.033	0126	861018	204/51666	CLUB	38	11.0	
0087	Tres	204/51359	CLUB	30	11.5		0127	861018	204/51684	CLUB	37	12.1	
0088	861018	204/51410	CLUB	33	11.6		0128	861018	204/51685	CLUB			
0089	861018	204/51415	CLUB	34	11.6		0129	861018	204/51714	CLUB	28	11.6	
0090	861018	204/51418	CLUB	36	11.0		0130	861018	204/51715	CLUB			
0091	861018	204/51419	CLUB	28	12.2		0131	861018	204/51716	CLUB			
0092	861018	204/51421	CLUB	29	12.0		0132	861018	204/51723	CLUB	34	10.6	
0093	861018	204/51428	CLUB	35	10.8		0133	861018	204/51726	CLUB	32	11.5	
0094	861018	204/51446	CLUB	32	11.0		0134	861018	204/51737	CLUB	25	11.6	
0095	861018	204/51450	CLUB	34	10.5		0135	861018	204/51742	CLUB	29	9.1	
0096	861018	204/51452	CLUB	45	11.0		0136	861018	204/51799	CLUB	32	10.2	
0097	861018	204/51457	CLUB	29	10.4		0137	861018	204/51800	CLUB	33	10.3	
0098	861018	204/51461	CLUB	29	10.6		0138	861018	204/51809	CLUB	31	9.1	
0099	861018	204/51463	CLUB				0139	861018	204/51811	CLUB	33	9.4	
0100	861018	204/51476	CLUB	24	10.6		0140	861018	204/51813	CLUB	83	11.1	
0101	861018	204/51477	CLUB	26	9.5		0141	861018	204/51814	CLUB	87	11.0	
0102	861018	204/51485	CLUB	32	11.1		0142	861018	204/51815	CLUB	84	11.1	
0103	861018	204/51486	CLUB	28	10.6		0143	Omar	204/51816	CLUB	26	9.0	
0104	861018	204/51495	CLUB				0144	Tres	204/51818	CLUB			
0105	861018	204/51496	CLUB				0145	861018	204/51825	CLUB	80	11.1	
0106	861018	204/51497	CLUB				0146	861018	204/51826	CLUB			
0107	861018	204/51508	CLUB	37	11.1		0147	861018	204/51827	CLUB	87	11.0	
0108	861018	204/51509	CLUB	37	11.5		0148	861018	204/51828	CLUB	85	11.7	
0109	861018	204/51510	CLUB	31	11.1		0149	861018	204/51829	CLUB	79	11.7	
0110	861018	204/51511	CLUB	34	11.4		0150	861018	204/51830	CLUB	75	11.6	
0111	861018	204/51516	CLUB	32	11.9		0151	861018	204/51838	CLUB	40	9.4	
0112	861018	204/51518	CLUB	36	12.3		0152	861018	204/51844	CLUB	38	10.7	
0113	861018	204/51522	CLUB	27	11.7		0153	861018	204/51849	CLUB	32	9.6	
0114	861018	204/51523	CLUB	26	11.7		0154	Omar	204/51855	CLUB	26	9.7	
0115	861018	204/51524	CLUB	32	11.7		0155	Tres	204/51857	CLUB	27	9.4	0.029
0116	861018	204/51576	CLUB	55	11.0		0156	861018	204/51862	CLUB	43	11.0	
0117	Omar	204/51582	CLUB	30	11.9	0.030	0157	861018	204/51865	CLUB	42	11.7	
0118	Tres	204/51584	CLUB	34	10.5		0158	861018	204/51874	CLUB			
0119	861018	204/51594	CLUB	27	11.0		0159	861018	204/51886	CLUB	42	9.3	
0120	861018	204/51595	CLUB	38	10.5		0160	861018	204/51892	CLUB	42	10.0	

WPROT = Wheat grain protein UWHRD = NIR grain hardness DSI = Phadebas Amylase Test No data = missing sample

* As is moisture basis

** DSI reading greater than 0.120 denotes sprout damage

SAMPLE#	VARIETY	BREEDER#	CLASS	UWHRD	WPROT*	DSI**	SAMPLE#	VARIETY	BREEDER#	CLASS	UWHRD	WPROT*	DSI**
0161	861018	204/51901	CLUB	34	10.5		0201	861018	204/52255	CLUB	36	10.7	
0162	861018	204/51919	CLUB	37	10.9		0202	861018	204/52276	CLUB	33	8.6	
0163	861018	204/51959	CLUB	36	10.4		0203	861018	204/52279	CLUB	32	8.2	
0164	861018	204/51961	CLUB	32	9.8		0204	861018	204/52285	CLUB	43	9.5	
0165	861018	204/51982	CLUB	34	11.2		0205	861018	204/52336	CLUB	33	11.5	
0166	861018	204/51987	CLUB	37	10.0		0206	Omar	204/52341	CLUB	43	10.9	
0167	861018	204/51992	CLUB	35	11.4		0207	Tres	204/52343	CLUB	36	11.6	
0168	861018	204/51994	CLUB	35	11.6		0208	861018	204/52356	CLUB	33	10.0	
0169	861018	204/51997	CLUB	30	10.6		0209	861018	204/52359	CLUB	33	8.5	
0170	861018	204/52014	CLUB				0210	861018	204/52360	CLUB	35	8.4	
0171	861018	204/52015	CLUB				0211	861018	204/52363	CLUB	33	9.8	
0172	861018	204/52016	CLUB				0212	861018	204/52366	CLUB	27	10.8	
0173	861018	204/52020	CLUB				0213	860030	204/52372	CLUB	36	10.5	
0174	861018	204/52021	CLUB				0214	860030	204/52373	CLUB	41	10.3	
0175	861018	204/52022	CLUB				0215	860030	204/52376	CLUB	36	11.4	
0176	861018	204/52024	CLUB	38	12.1		0216	860030	204/52379	CLUB	28	10.2	
0177	861018	204/52027	CLUB	42	10.9		0217	Omar	204/52380	CLUB	33	10.0	
0178	861018	204/52048	CLUB	34	10.0		0218	Tres	204/52382	CLUB	38	11.7	
0179	861018	204/52051	CLUB	43	11.4		0219	860030	204/52389	CLUB	40	12.5	
0180	Omar	204/52056	CLUB	32	11.3		0220	860030	204/52390	CLUB	42	13.4	
0181	Tres	204/52058	CLUB	42	12.0		0221	860030	204/52396	CLUB	37	11.8	
0182	861018	204/52066	CLUB	36	11.2		0222	860030	204/52397	CLUB	39	13.7	
0183	861018	204/52116	CLUB	89	13.9		0223	860030	204/52481	CLUB	39	11.2	
0184	861018	204/52117	CLUB	87	12.7		0224	860030	204/52497	CLUB	37	9.8	
0185	861018	204/52118	CLUB	81	13.6		0225	860030	204/52498	CLUB	41	10.4	
0186	861018	204/52125	CLUB				0226	Omar	204/52503	CLUB	34	10.2	
0187	861018	204/52126	CLUB				0227	Tres	204/52505	CLUB	35	9.4	
0188	861018	204/52127	CLUB				0228	860030	204/52551	CLUB	37	10.8	
0189	861018	204/52150	CLUB	32	9.3		0229	860030	204/52576	CLUB	33	10.0	
0190	861018	204/52151	CLUB	32	9.7		0230	860030	204/52577	CLUB	38	10.6	
0191	861018	204/52152	CLUB	24	9.8		0231	860030	204/52596	CLUB	36	10.7	
0192	861018	204/52155	CLUB	34	10.4		0232	860030	204/52618	CLUB	42	11.2	
0193	861018	204/52156	CLUB	34	9.9		0233	860030	204/52621	CLUB	37	11.4	
0194	861018	204/52157	CLUB	34	10.7		0234	860030	204/52657	CLUB	40	12.7	
0195	861018	204/52195	CLUB	33	10.3		0235	860030	204/52663	CLUB	38	10.9	
0196	861018	204/52196	CLUB	34	11.2		0236	860030	204/52672	CLUB	42	9.7	
0197	861018	204/52207	CLUB	35	10.9		0237	860030	204/52673	CLUB	45	10.7	
0198	Omar	204/52212	CLUB	32	10.6		0238	Omar	204/52683	CLUB	32	11.0	
0199	Tres	204/52214	CLUB	24	11.4		0239	Tres	204/52685	CLUB	39	11.5	
0200	861018	204/52249	CLUB	33	9.8		0240	860030	204/52704	CLUB	31	12.1	

WPROT = Wheat grain protein UWHRD = NIR grain hardness DSI = Phadebas Amylase Test No data = Missing sample

* As is moisture basis

** DSI reading greater than 0.120 denotes sprout damage

SAMPLE#	VARIETY	BREEDER#	CLASS	UWHRD	WPROT*	DSI**	SAMPLE#	VARIETY	BREEDER#	CLASS	UWHRD	WPROT*	DSI**
0241	860030	204/52753	CLUB	42	11.9		0281	860030	204/53228	CLUB	39	13.5	
0242	860030	204/52754	CLUB	37	12.8		0282	860030	204/53283	CLUB	38	11.8	
0243	860030	204/52766	CLUB	34	11.1		0283	860030	204/53295	CLUB	34	11.1	
0244	860030	204/52767	CLUB	37	12.9		0284	860030	204/53297	CLUB	37	11.3	
0245	860030	204/52785	CLUB	36	11.9		0285	860030	204/53316	CLUB	32	10.5	
0246	860030	204/52812	CLUB	43	12.6		0286	860030	204/53317	CLUB	37	10.3	
0247	860030	204/52813	CLUB	37	12.6		0287	860030	204/53362	CLUB			
0248	860030	204/52814	CLUB				0288	860030	204/53363	CLUB	34	10.5	
0249	860030	204/52816	CLUB	42	12.7		0289	860030	204/53406	CLUB	32	11.0	
0250	860030	204/52818	CLUB	41	12.4		0290	860030	204/53412	CLUB	40	12.5	
0251	860030	204/52821	CLUB	42	14.0		0291	860030	204/53413	CLUB	35	11.7	
0252	860030	204/52825	CLUB	45	12.7		0292	860030	204/53415	CLUB	36	11.8	
0253	860030	204/52826	CLUB	43	11.8		0293	860030	204/53417	CLUB	33	11.4	
0254	Omar	204/52851	CLUB	37	13.4	0.049	0294	860030	204/53419	CLUB	38	12.6	
0255	Tres	204/52853	CLUB	40	11.9		0295	860030	204/53422	CLUB	41	12.3	
0256	860030	204/52863	CLUB	43	11.4		0296	860030	204/53424	CLUB	35	11.5	
0257	860030	204/52864	CLUB	39	11.5		0297	860030	204/53426	CLUB	32	11.1	
0258	860030	204/52865	CLUB	31	10.8		0298	Omar	204/53427	CLUB	45	12.6	
0259	860030	204/52903	CLUB	43	11.8		0299	Tres	204/53429	CLUB	60	12.0	
0260	860030	204/52904	CLUB	41	11.6		0300	860030	204/53436	CLUB	34	11.4	
0261	860030	204/52922	CLUB	38	11.6		0301	860030	204/53437	CLUB			
0262	860030	204/52969	CLUB	37	11.6		0302	860030	204/53438	CLUB	22	12.8	
0263	860030	204/53011	CLUB	39	12.0		0303	Omar	204/53466	CLUB	35	10.9	
0264	860030	204/53015	CLUB	38	11.8		0304	Tres	204/53468	CLUB	34	11.6	
0265	860030	204/53025	CLUB	31	11.5		0305	860030	204/53479	CLUB	32	10.9	
0266	Omar	204/53031	CLUB			0.031	0306	860030	204/53483	CLUB	32	11.8	
0267	Tres	204/53033	CLUB	41	11.5		0307	860030	204/53523	CLUB	32	9.9	
0268	860030	204/53089	CLUB	37	11.8		0308	860030	204/53525	CLUB	28	11.5	
0269	860030	204/53092	CLUB				0309	860030	204/53532	CLUB	25	10.4	
0270	860030	204/53094	CLUB	35	11.0		0310	860030	204/53533	CLUB	33	10.2	
0271	860030	204/53095	CLUB	39	12.0		0311	860030	204/53536	CLUB	32	11.0	
0272	860030	204/53096	CLUB	37	12.3		0312	860030	204/53539	CLUB	35	10.7	
0273	860030	204/53100	CLUB	34	13.0		0313	Omar	204/53544	CLUB	36	10.8	0.026
0274	860030	204/53101	CLUB	31	12.6		0314	Tres	204/53546	CLUB	43	10.8	
0275	860030	204/53104	CLUB	32	11.2		0315	860030	204/53567	CLUB	41	13.0	
0276	Omar	204/53109	CLUB	29	11.8		0316	860030	204/53592	CLUB	81	13.0	
0277	Tres	204/53111	CLUB	38	11.9		0317	860030	204/53593	CLUB	85	12.7	
0278	860030	204/53134	CLUB	32	11.6		0318	860030	204/53594	CLUB	81	13.3	
0279	860030	204/53135	CLUB	33	11.2		0319	860030	204/53603	CLUB	87	14.1	
0280	860030	204/53172	CLUB	32	11.7		0320	860030	204/53646	CLUB	95	14.1	

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* As is moisture basis

** DSI reading greater than 0.120 denotes sprout damage

SAMPLE#	VARIETY	BREEDER#	CLASS	UWHRD	WPROT*	DSI**	SAMPLE#	VARIETY	BREEDER#	CLASS	UWHRD	WPROT*	DSI**
0321	860030	204/53647	CLUB	89	14.4		0361	860030	204/53846	CLUB	27	11.7	
0322	860030	204/53648	CLUB	90	14.4		0362	860030	204/53847	CLUB	31	12.1	
0323	860030	204/53664	CLUB	42	12.7		0363	860030	204/53848	CLUB	32	12.1	
0324	860030	204/53666	CLUB	35	13.4		0364	860030	204/53850	CLUB	41	12.3	
0325	Omar	204/53667	CLUB	35	13.1		0365	860030	204/53851	CLUB	43	12.5	
0326	Tres	204/53669	CLUB	39	12.8		0366	860030	204/53853	CLUB	35	12.8	
0327	860030	204/53676	CLUB	43	14.3		0367	860030	204/53854	CLUB	30	12.7	
0328	860030	204/53681	CLUB	38	13.5		0368	Omar	204/53862	CLUB	34	12.3	
0329	860030	204/53692	CLUB	38	13.8		0369	Tres	204/53864	CLUB	45	12.4	0.030
0330	860030	204/53703	CLUB	45	10.8		0370	860030	204/53865	CLUB	42	12.0	
0331	860030	204/53704	CLUB	36	11.2		0371	860030	204/53866	CLUB	42	12.1	
0332	Omar	204/53706	CLUB	39	12.5		0372	860030	204/53867	CLUB	27	12.5	
0333	Tres	204/53708	CLUB	50	11.8		0373	860030	204/53873	CLUB	31	12.8	
0334	860030	204/53712	CLUB	31	12.5		0374	860030	204/53875	CLUB	28	12.1	
0335	860030	204/53741	CLUB	36	13.5		0375	860030	204/53880	CLUB	31	12.7	
0336	860030	204/53748	CLUB	37	13.3		0376	860030	204/53897	CLUB	28	12.1	
0337	860030	204/53750	CLUB	39	12.7		0377	Omar	204/53901	CLUB	32	11.5	
0338	860030	204/53763	CLUB	38	12.7		0378	Tres	204/53903	CLUB	40	11.3	
0339	860030	204/53764	CLUB	39	12.8		0379	860030	204/53905	CLUB	30	12.0	
0340	860030	204/53766	CLUB	41	13.3		0380	860030	204/53909	CLUB	31	11.3	
0341	Omar	204/53784	CLUB	36	12.9		0381	860030	204/53919	CLUB	40	12.3	
0342	Tres	204/53786	CLUB	40	13.3	0.032	0382	860030	204/53921	CLUB	26	11.6	
0343	860030	204/53798	CLUB	37	13.4		0383	860030	204/53928	CLUB	36	11.6	
0344	860030	204/53800	CLUB	40	12.3		0384	860030	204/53931	CLUB	40	12.2	
0345	860030	204/53801	CLUB	41	12.5		0385	860030	204/53933	CLUB	38	12.3	
0346	860030	204/53803	CLUB	39	13.4		0386	860030	204/53934	CLUB	42	12.3	
0347	860030	204/53804	CLUB	41	13.5		0387	860030	204/53935	CLUB	47	12.7	
0348	860030	204/53806	CLUB	38	13.9		0388	860030	204/53938	CLUB	45	12.2	
0349	860030	204/53812	CLUB	39	11.7		0389	Omar	204/53940	CLUB	43	12.0	
0350	860030	204/53822	CLUB	43	11.9		0390	Tres	204/53942	CLUB	45	12.4	
0351	Omar	204/53823	CLUB	33	11.6		0391	860030	204/53957	CLUB	39	11.5	
0352	Tres	204/53825	CLUB	39	12.1		0392	860030	204/53962	CLUB	42	11.8	
0353	860030	204/53826	CLUB	40	12.3		0393	860030	204/53964	CLUB	44	10.8	
0354	860030	204/53827	CLUB	39	12.1		0394	Omar	204/53979	CLUB	35	10.3	
0355	860030	204/53828	CLUB	24	12.0		0395	Tres	204/53981	CLUB	36	10.3	
0356	860030	204/53832	CLUB	46	12.5		0396	860030	204/54009	CLUB	30	11.9	
0357	860030	204/53833	CLUB	43	12.9		0397	860030	204/54010	CLUB	39	11.6	
0358	860030	204/53840	CLUB	40	12.4		0398	860030	204/54011	CLUB	45	12.2	
0359	860030	204/53843	CLUB	37	12.9		0399	860030	204/54024	CLUB	39	10.8	
0360	860030	204/53844	CLUB	30	12.4		0400	860030	204/54026	CLUB	41	11.6	

WPROT = Wheat grain protein UWHRD = NIR grain hardness DSI = Phadebas Amylase Test No data = Missing sample

* As is moisture basis

** DSI reading greater than 0.120 denotes sprout damage

SAMPLE#	VARIETY	BREEDER#	CLASS	UWHRD	WPROT*	DSI**	SAMPLE#	VARIETY	BREEDER#	CLASS	UWHRD	WPROT*	DSI**
0401	860030	204/54038	CLUB	38	12.3		0441	860030	204/54258	CLUB	35	12.4	
0402	860030	204/54043	CLUB	41	14.1		0442	860030	204/54263	CLUB	37	12.1	
0403	860030	204/54049	CLUB	36	13.6		0443	Omar	204/54264	CLUB	42	11.8	
0404	860030	204/54053	CLUB	47	13.0		0444	Tres	204/54266	CLUB	35	10.8	
0405	Omar	204/54057	CLUB	41	12.2		0445	860030	204/54267	CLUB	38	11.2	
0406	Tres	204/54059	CLUB	42	12.6		0446	860030	204/54268	CLUB	36	11.1	
0407	860030	204/54074	CLUB	43	12.1		0447	860030	204/54272	CLUB	37	10.8	
0408	860030	204/54075	CLUB	48	11.9		0448	860030	204/54280	CLUB	33	11.3	
0409	860030	204/54082	CLUB	43	13.0		0449	860030	204/54291	CLUB	38	10.8	
0410	860030	204/54090	CLUB	42	13.9		0450	860030	204/54293	CLUB	37	10.0	
0411	860030	204/54091	CLUB				0451	860030	204/54297	CLUB	34	10.2	
0412	860030	204/54092	CLUB				0452	860030	204/54299	CLUB	41	11.0	
0413	860030	204/54095	CLUB				0453	860030	204/54301	CLUB	36	10.5	
0414	Omar	204/54096	CLUB	42	11.6	0.027	0454	860030	204/54308	CLUB	45	11.7	
0415	Tres	204/54098	CLUB				0455	860030	204/54309	CLUB	34	10.7	
0416	860030	204/54146	CLUB				0456	860030	204/54311	CLUB	30	10.6	
0417	860030	204/54167	CLUB	42	13.7		0457	860030	204/54312	CLUB	32	11.3	
0418	860030	204/54177	CLUB	39	13.1		0458	860030	204/54313	CLUB	33	11.5	
0419	860030	204/54184	CLUB	34	11.2		0459	Omar	204/54315	CLUB			
0420	Omar	204/54186	CLUB	32	9.7		0460	Tres	204/54317	CLUB			
0421	Tres	204/54188	CLUB	34	9.9		0461	860030	204/54318	CLUB	32	12.5	
0422	860030	204/54189	CLUB	41	10.0								
0423	860030	204/54190	CLUB	29	9.7								
0424	860030	204/54192	CLUB	27	10.1								
0425	860030	204/54200	CLUB	33	11.4								
0426	860030	204/54201	CLUB	35	10.9								
0427	860030	204/54206	CLUB	33	10.5								
0428	860030	204/54209	CLUB	43	10.2								
0429	860030	204/54220	CLUB	30	9.8								
0430	860030	204/54223	CLUB										
0431	Omar	204/54225	CLUB	36	10.9								
0432	Tres	204/54227	CLUB	42	10.3								
0433	860030	204/54238	CLUB	33	12.4								
0434	860030	204/54239	CLUB										
0435	860030	204/54246	CLUB	36	12.2								
0436	860030	204/54247	CLUB	34	12.7								
0437	860030	204/54251	CLUB	28	12.5								
0438	860030	204/54252	CLUB	40	12.9								
0439	860030	204/54253	CLUB	29	12.5								
0440	860030	204/54256	CLUB	34	12.1								

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* As is moisture basis

** DSI reading greater than 0.120 denotes sprout damage

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0001	BD 123-92		HWS	63.9 +2			64.0 -2	30.6	0.41	77.8 -	10.8 -	61.2
0002	BD 124-92		HWS	62.6 +			62.4 -2	28.8	0.45 -2	74.0 -2	9.3 -2	58.8
0003	BD 177-92		HRS	59.4			66.0 -	29.6	0.47 -2	76.8 -2	10.9 -	60.1
0004	BD 200-92		HWS	59.8			64.5 -2	29.7	0.44 -	76.8 -2	10.1 -	54.9 -2
0005	BD 216-92		HWS	60.7			66.3	32.7	0.45 -2	78.1 -	10.6 -	59.1
0006	BD 386-92		HWS	63.4 +2			67.0	32.7	0.45 -2	78.9 -	10.0 -	59.0
0007	BD 387-92		HWS	61.5 +			64.9 -2	32.0	0.46 -2	76.1 -2	10.6 -	58.9
0008	BD 393-92		HWS	58.7			62.7 -2	29.1	0.44 -	74.9 -2	10.6 -	55.7 -
0009	BD 395-92		HWS	60.5			65.0 -	30.3	0.44 -	77.3 -2	10.1 -	55.7 -
0010	BD 402-92		HWS	59.3			64.5 -2	32.4	0.45 -2	76.2 -2	11.4	56.9 -
0011	BD 412-92		HWS	60.8			65.7 -	33.7	0.47 -2	76.5 -2	9.7 -2	56.0 -
0012	BD 463-92		HWS	63.3 +2			63.9 -2	31.9	0.44 -	76.1 -2	11.2 -	59.0
0013	B46; 79-90		HWS	53.8 -2			61.1 -2	31.0	0.51 -2	69.6 -2	18.3 +2	64.5 +
0014	B186; 49-5		HWS	54.6 -2			61.7 -2	31.3	0.52 -2	69.7 -2	18.2 +2	65.7 +
0015	B186; 119		HWS	54.0 -2			60.5 -2	31.7	0.57 -2	65.8 -2	19.0 +2	65.5 +
0016	V763/V879; 199		HWS	54.8 -2			63.7 -2	35.7	0.52 -2	71.7 -2	17.6 +2	65.5 +
0017	WED 3		HWS	56.8 -			65.6 -	35.4	0.44 -	77.9 -	15.8 +2	64.4 +
0018	WED 36		HWS	57.5 -			64.8 -2	35.2	0.43 -	77.6 -	15.6 +2	64.7 +
0019	WED 43		HWS	57.5 -			65.4 -	35.9	0.44 -	77.7 -	15.7 +2	65.5 +
0020	WED 53		HWS	58.8			65.4 -	33.6	0.46 -2	76.7 -2	14.3 +	64.7 +
0021	WED 56		HWS	58.4			66.5	35.4	0.42	79.9	15.1 +	64.5 +
0022	WED 71		HWS	58.1			63.9 -2	34.0	0.45 -2	75.6 -2	15.0 +	64.7 +
0023	WED 122		HWS	55.7 -2			62.3 -2	31.8	0.40	76.6 -2	13.1	62.3
0024	WED 127		HWS	56.6 -			65.9 -	35.0	0.50 -2	75.1 -2	15.6 +2	64.5 +
0025	WED 46		HWS									
0026	WED 64		HWS	57.8			66.3	34.3	0.42	79.7	15.0 +	64.7 +
*0027	SPILLMAN		HRS	59.4			67.2	37.5	0.40	81.7	12.6	60.8
0028	PAVON		HWS	61.8 +			64.0 -2	29.7	0.39	78.9 -	10.7 -	57.5 -
0029	SPELT		SPELT	59.3			53.9 -2	30.3	0.45 -2	65.2 -2	11.0 -	58.5

* = standard mean nursery flour protein = 13.1 mill used = Quad

Standard Mean	HRS	59.4					67.2	37.5	0.40	81.7	12.6	60.8
Nursery Mean	HWS	58.8					64.3	32.6	0.45	75.8	13.3	61.4
Nursery Standard deviation	HWS	2.99					1.74	2.19	0.041	3.38	3.13	3.83
Standard Mean	HRS	59.4					67.2	37.5	0.40	81.7	12.6	60.8
Nursery Mean	HRS	59.4					62.4	32.5	0.44	74.6	11.5	59.8
Nursery Standard deviation	HRS	0.06					7.36	4.37	0.036	8.47	0.95	1.18

SAMPLE#	BREEDER#	MTYPE	BABS	MTIME	LVOL	BCRGR	PROQ
0001		4H	64.4	3.9 +	855 -2	4	0
0002		6M	61.0 -	3.6	790 -2	5	+1
0003		2H	63.3	2.4	860 -2	5	0
0004		3M	59.1 -2	2.8	715 -2	8	-1
0005		3M	61.3 -	2.1	870 -2	5	+1
0006		7M	62.2	4.0 +	840 -2	3	+1
0007		7M	61.1 -	4.4 +	875 -2	4	+1
0008		4M	59.9 -	2.9	820 -2	5	0
0009		4M	57.9 -2	2.4	830 -2	4	+1
0010		2H	61.1 -	2.1	750 -2	7	-1
0011		4M	58.2 -2	2.8	810 -2	4	+1
0012		4H	61.2 -	4.3 +	870 -2	4	0
0013		1H	66.7	1.3	770 -2	6	-1
0014		1H	68.9 +	1.4	850 -2	6	-1
0015		1H	68.7 +	1.3	830 -2	6	-1
0016		1H	68.7 +	1.3	855 -2	6	-1
0017		1H	66.6	1.8	925 -2	5	-1
0018		1H	66.9 +	1.7	985 -	5	-1
0019		1H	69.2 +2	1.9	1060	3	-1
0020		1H	68.4 +	1.9	1055	4	0
0021		1H	68.2 +	1.5	900 -2	6	-1
0022		1H	68.4 +	1.4	900 -2	6	-1
0023		2H	66.0	3.2	985 -	5	0
0024		1H	68.2 +	1.9	1035	4	-1
0025							
0026		1H	68.4 +	1.7	990 -	5	-1
*0027		2H	64.5	2.4	1055	3	+1
0028		3H	64.2	2.9	930 -2	6	+1
0029		2H	62.2	2.7	795 -2	4	-1
* = standard mean nursery flour protein = 13.1 mill used = Quad							
HRS			64.5	2.4	1055	3	
HWS			64.6	2.4	884	5	
HWS			3.88	1.00	93.1	1.2	
HRS			64.5	2.4	1055	3	
HRS			63.3	2.5	903	4	
HRS			1.15	0.17	135.3	1.0	

COMMENTS: Quality parameters of HWS and HRS lines in this nursery were graded by comparison to the standard mean of Spillman. The lines designated BD were harvested in Israel. The other lines were presumed harvested in Pullman. Since the standard mean of Spillman was used to grade all lines, interpretation of the quality data of the Israel harvested samples would not be a sound comparison. Sample #920025 (WED 46) was missing. NIR wheat hardness (UWHRD) and wheat protein content (WPROT) were not analyzed by the Western Wheat Quality Laboratory. It is available by contacting the breeder. Most of the lines had flour yield and/or milling score significantly less than that of Spillman. Flour ash content of most lines was quite elevated. There was a large range in flour protein content (9.3 to 19.0%). Mixogram and bake absorption varied widely due to the large range in flour protein content. Mixograms of several lines were typed as 1H and 3-4M. Dough mixing times ranged from 1.3 to 4.0 minutes with the majority under 2.5 minutes. Bread loaf volume of most lines was significantly less than that of Spillman. Sample #'s 920019, 920020 and 920024 had volume comparable to Spillman. About one-half of the lines had loaf volume significantly less than that expected for their flour protein content as graded by their protein quality (PROQ) rating. The other lines had volume equal to or significantly higher than expected for their flour protein content. The mean nursery flour protein content was 13.1% and at this level one should expect a loaf volume near 990 cc if the protein is of good quality. Bread crumb grain score ranged from 3 to 8 with most in the questionable-satisfactory (4) to questionable (6) area, compared to Spillman which was judged as near satisfactory (3).

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UWHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0001	BZ684023	2	SWS	57.3	17	10.9	69.8 +2	53.8	0.37	86.4 +	9.0	51.9
0002	ID392	4	SWS	59.1	15	11.4	71.2 +2	53.4	0.38	87.6 +	9.1	52.8
0003	CENTENNIAL	3	SWS	59.4	15	10.9	70.3 +2	51.5	0.35	88.3 +2	8.9	53.6
*0004	WA7677	14	SWS	58.8	25	11.4	67.4	49.7	0.36	84.0	9.5	51.9
0005	SPRITE	16	SWS	59.3	16	11.6	70.2 +2	50.4	0.32 +2	90.1 +2	9.3	52.4
0006	ID420	20	HRS	59.5	52	13.1	71.9 +2	45.5	0.32 +	90.8 +	11.7	60.4
0007	PH986061	25	HRS	60.0	64	13.1	71.2 +	40.7	0.38 -	86.9	11.9	61.3
*0008	WP8906R	31	HRS	59.0	60	14.1	69.7	41.4	0.35	86.9	12.5	59.5
0009	WP8926	32	HRS	58.6	54	14.3	69.9	40.7	0.38 -	85.5	12.7	61.5
0010	EXPRESS	33	HRS	59.6	66	14.4	69.3	39.5	0.37 -	85.4	13.1	63.0 +

* = standard mean nursery flour protein = 10.8 mill used = Quad

Standard Mean	SWS	25	58.8	25	11.4	67.4	49.7	0.36	84.0	9.5	51.9
Nursery Mean	SWS	18	58.8	18	11.2	69.8	51.8	0.36	87.3	9.2	52.5
Nursery Standard deviation	SWS	4.2	0.86	4.2	0.32	1.43	1.80	0.023	2.27	0.24	0.71
Standard Mean	HRS	60	59.0	60	14.1	69.7	41.4	0.35	86.9	12.5	59.5
Nursery Mean	HRS	59	59.3	59	13.8	70.4	41.6	0.36	87.1	12.4	61.1
Nursery Standard deviation	HRS	6.1	0.55	6.1	0.65	1.10	2.31	0.025	2.19	0.58	1.31

SAMPLE#	BREEDER#	MTYPE	CODI	TGS	CAVOL	SCSCOR	BABS	MTIME	LVOL	BCGR	PROQ	RVA
0001	2	3M	9.65 +2	8	1320 +	75						118
0002	4	2M	9.40 +2	8	1335 +	77						182
0003	3	3M	9.40 +2	8	1235	71						231
*0004	14	6M	8.81	7	1270	73						173
0005	16	2M	8.82	8	1180 -2	67 -						105
0006	20	5H					62.6	5.0 +	955 -2	3	+1	
0007	25	5H					64.5 +	5.0 +	1030	3	+1	
*0008	31	3H					61.7	3.4	1050	4	+1	
0009	32	3H					63.7	3.1	1125 +	4	+1	
0010	33	2H					65.2 +	1.7 -	1180 +2	5	+1	

* = standard mean nursery flour protein = 10.8 mill used = Quad

SWS	8.81	7	1270	73								173
SWS	9.22	8	1268	73								162
SWS	0.380	0.4	63.3	3.8								51.2

HRS	61.7	3.4	1050	4								
HRS	63.5	3.6	1068	4								
HRS	1.41	1.40	87.1	0.8								

COMMENTS: Quality parameters of SWS selections were graded by comparison to the standard mean of WA7677. Quality parameters of HRS selections were graded by comparison to the standard mean of WP8906R. Cookie and Japanese sponge cakes were baked on all SWS lines. Bread was baked on all HRS lines. Rapid Visco Analyzer (RVA) viscosity was determined on the SWS lines. RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable.

SAMPLE#	VARIETY	LECOMPROT*
0001	PENAWAWA	12.10
0002	YECORA ROJO	12.34
0003	SPILLMAN	13.41
0004	WPB906R	14.90
0005	WA7715	14.15
0006	DX88031-523	10.27
0007	DX89008-615	13.60
0008	WPB881 9204	16.15
0009	WPB881 1991-05	13.41
0010	WPB881 9015	15.41
0011	WPB881-347 9014	13.97
0012	WPB881 9205	16.02
0013	WPB881 9201	15.92

* Protein determined by elemental nitrogen analysis. As is moisture.

SAMPLE#	VARIETY	BREEDER#	CLASS	LOCATION	RVA
0001	A89186S-1	9868	HWS	ABERDEEN	198
0002	A89186S-2	9869	HWS	ABERDEEN	202
0003	A89187S-1	9870	HWS	ABERDEEN	240
0004	A89187S-2	9871	HWS	ABERDEEN	212
0005	A89187S-3	9872	HWS	ABERDEEN	225
0006	A89215S-1	9873	HWS	ABERDEEN	250
0007	A89215S-2	9874	HWS	ABERDEEN	236
0008	A89215S-3	9875	HWS	ABERDEEN	217
0009	KLASIC	9876	HWS	ABERDEEN	188
0010	A89232S-2	9878	HWS	ABERDEEN	179
0011	A89232S-3	9879	HWS	ABERDEEN	207
0012	A89232S-4	9880	HWS	ABERDEEN	270
0013	A89294S-1	9881	HWS	ABERDEEN	206
0014	A89294S-2	9882	HWS	ABERDEEN	221
0015	A89297S-1	9883	HWS	ABERDEEN	256
0016	A89297S-2	9884	HWS	ABERDEEN	243
0017	GOLDEN86	9885	HWS	ABERDEEN	190
0018	A89297S-3	9886	HWS	ABERDEEN	191
0019	A89297S-5	9887	HWS	ABERDEEN	176
0020	A89297S-6	9888	HWS	ABERDEEN	213
0021	A89297S-7	9889	HWS	ABERDEEN	256
0022	A89298S-1	9890	HWS	ABERDEEN	261
0023	A89298S-2	9891	HWS	ABERDEEN	207
0024	COULEE	207	HWS	ABERDEEN	236

COMMENTS: Twenty-three HWS wheat flours and one HWS wheat flour were evaluated for Rapid Visco Analyzer (RVA) viscosity. Viscosities ranged from near 180 to over 270. RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable.

LABNUM	VARIETY	TUT	% BRAN	% BREAK	POTENTIAL FY
1560001*	KMOR/LEWJAIN	57.4	24.6	49.5	75.4
1560002	MT36/WHIT//AR876101	40.3	30.4	38.3	69.6
1560003	MT36/WHIT//AR876101	45.1	31.4	39.3	68.6
1560004	MT36/WHIT//VT087121	51.3	22.3	31.8	77.7
1560005	MT36/WHIT//VT087127	49.2	24.7	44.6	75.3
1560006	MT36/WHIT//VT087127	58.6	23.0	51.9	77.0
1560007	MT36/WHIT//VT087127	56.8	23.4	51.0	76.6
1560008	MT36/WHIT//VT087127	58.3	20.8	53.0	79.2
1560009	VT082481-MT36/WHIT//C337	56.9	23.2	47.2	76.8
1560010	VT082481-MT36/WHIT//C337	56.8	24.0	49.4	76.0
1560011	VT082481-MT36/WHIT//C337	57.7	24.6	47.1	75.4
1560012	VT082481-MT36/WHIT//C337	58.1	24.3	49.2	75.7
1560013	VT082481-MT36/WHIT//C367	47.4	27.1	47.1	72.9
1560014	HUNTSMAN/VH74521//LJN	56.3	23.6	52.7	76.4
1560015	HUNTSMAN/VH74521//LJN	56.8	23.6	52.4	76.4
1560016	HUNTSMAN/VH74521//LJN	56.7	22.4	54.8	77.6
1560017	HUNTSMAN/VH74521//LJN	58.2	21.8	52.0	78.2
1560018	WA007627//BRIGAND/SPN	58.7	22.6	51.0	77.4
1560019	WA007627//WA007628	59.1	21.8	49.3	78.2
1560020*	DAWS	57.5	29.0	44.0	71.0
1560021	WA007627//OR000843	59.9	18.4	39.3	81.6
1560022	WA007627//WA007621	60.3	19.1	43.5	80.9
1560023	WA007627//SPN/ROAZON/101	53.6	24.7	42.9	75.3
1560024	WA007627//SPN/ROAZON/101	54.1	26.7	49.2	73.3
1560025	WA007627//SPN/ROAZON/101	53.5	26.7	51.3	73.3
1560026	WA007627//SPN/ROAZON/101	56.3	25.4	50.9	74.6
1560027	ID3528/WA6814//LEWJAIN	54.3	28.5	47.9	71.5
1560028	ID3528/WA6814//HYAK	58.4	22.1	49.9	77.9
1560029	WA007628//OR000843	57.0	23.3	48.4	76.7
1560030	WA007628//OR000843	53.1	24.5	51.1	75.5
1560031	WA007628//OR000843	56.1	23.3	49.7	76.7
1560032	WA007628//WA007621	56.9	22.6	47.3	77.4
1560033	BOKOLO/WHIT//LASKO	52.2	24.8	41.1	75.2
1560034	WA007628//SPN/ROAZON/101	45.7	26.5	43.5	73.5
1560035	WA007628//SPN/ROAZON/101	55.4	23.8	44.3	76.2
1560036	WA007628//WA007624	55.6	25.0	41.9	75.0
1560037	WA007628//WA007624	55.4	24.0	42.0	76.0
1560038	FLORA/VT082481-MT36/WHIT	43.9	26.6	46.2	73.4
1560039	FLORA/VT082481-MT36/WHIT	47.5	30.6	39.1	69.4
1560040*	SPRAGUE	57.4	29.6	46.7	70.4
1560041	WA7622//HUNTSMAN/VH74521	57.3	25.0	48.1	75.0
1560042	TYEE/ROAZON/TRES//HYAK	54.0	24.2	47.9	75.8
1560043	TYEE/ROAZON/TRES//HYAK	55.1	23.9	48.9	76.1
1560044	TYEE/ROAZON/TRES//WA7628	56.4	.	.	.
1560045	TYEE/ROAZON/TRES//WA7628	49.1	28.0	40.8	72.0
1560046	TYEE/ROAZON/TRES//WA7628	45.1	30.1	39.3	69.9
1560047	TYEE/ROAZON/TRES//WA7628	56.3	25.0	46.0	75.0
1560048	TYEE/ROAZON/TRES//WA7628	48.4	27.3	41.8	72.7
1560049	TYEE/ROAZON/TRES//WA7628	58.2	24.1	45.0	75.9
1560050	TYEE/ROAZON/TRES//WA7628	56.2	24.0	49.1	76.0

LABNUM	VARIETY	TWT	% BRAN	% BREAK	POTENTIAL FY
1560051	TYEE/ROAZON/TRES//WA7628	56.1	22.6	47.9	77.4
1560052	TYEE/ROAZON/TRES//WA7628	54.9	24.0	50.1	76.0
1560053	MT008219//MT36/WHIT	50.8	25.3	40.3	74.7
1560054	TYEE/ROAZON/TRES//OR843	57.7	23.9	46.5	76.1
1560055	MT008219//MT36/WHIT	53.2	23.8	39.2	76.2
1560056	TYEE/ROAZON/TRES//WA7621	55.1	26.4	48.5	73.6
1560057	TYEE/ROAZON/TRES//WA7621	55.1	24.0	48.9	76.0
1560058	MT008219//AR876101	51.6	25.0	43.0	75.0
1560059	MT008219//AR876101	52.5	20.9	38.8	79.1
1560060*	LEWJAIN	59.3	24.5	49.5	75.5
1560061	MT008219//AR876101	51.4	20.9	39.0	79.1
1560062	TYEE/ROAZON/TRES//WA7624	56.1	23.0	42.9	77.0
1560063	MCVICAR/SU92//LEWJAIN	57.9	24.4	46.8	75.6
1560064	MCVICAR/SU92//LEWJAIN	58.1	23.6	46.9	76.4
1560065	MCVICAR//MHM/VH74521	57.8	23.4	52.7	76.6
1560066	MCVICAR//MHM/VH74521	55.0	27.9	45.7	72.1
1560067	MCVICAR//MHM/VH74521	55.4	27.3	49.9	72.7
1560068	MCVICAR//MHM/VH74521	56.1	24.0	51.4	76.0
1560069	MCVICAR//MHM/VH74521	56.4	26.9	51.0	73.1
1560070	MCVICAR//MHM/VH74521	55.5	24.3	50.6	75.7
1560071	MCVICAR//MHM/VH74521	57.5	26.4	47.9	73.6
1560072	MCVICAR//HYAK	55.5	24.1	52.0	75.9
1560073	MCVICAR//ID3528/WA6814	51.8	24.1	42.3	75.9
1560074	MCVICAR//HYSLOP/CERCO	56.8	25.7	45.3	74.3
1560075	MCVICAR//HYSLOP/CERCO	56.5	25.2	45.2	74.8
1560076	ARC08943//VT087503	49.4	25.9	47.2	74.1
1560077	ARC08943//VT087503	50.3	28.0	43.2	72.0
1560078	ARC08943//VT087503	45.9	27.7	44.6	72.3
1560079	ARC08943//VT087503	49.1	26.7	41.8	73.3
1560080#	MORO	56.8	25.4	54.1	74.6
1560081	ARC08943//VT087503	57.6	27.1	45.3	72.9
1560082	MCVICAR/WA007624	54.6	24.4	51.4	75.6
1560083	ARC08943//VT087503	55.7	27.4	46.2	72.6
1560084	ARC08943//VT087503	53.6	27.3	48.6	72.7
1560085	ID000330/DAWS	53.9	26.0	49.8	74.0
1560086	ID000330/DAWS	51.7	25.7	52.5	74.3
1560087	ID000330/DAWS	52.2	27.4	46.1	72.6
1560088	ID000330-NLY/2*SPN//LJN	57.9	25.5	49.9	74.5
1560089	ID000330/MADSEN	55.8	24.2	47.1	75.8
1560090	ID000330/MADSEN	55.3	26.3	46.4	73.7
1560091	ID000330/MADSEN	55.4	24.7	48.5	75.3
1560092	ID000330/MADSEN	56.6	21.6	49.5	78.4
1560093	ID000330/MADSEN	53.9	26.2	49.3	73.8
1560094	ID000330/MADSEN	52.5	23.9	53.0	76.1
1560095	ID000330-NLY/2*SPN//KMOR	52.3	24.0	52.5	76.0
1560096	ID000330-NLY/2*SPN//KMOR	56.6	25.1	47.0	74.9
1560097	ID000330/WA007627	53.9	24.9	47.3	75.1
1560098	ID000330/WA007627	56.3	26.5	48.1	73.5
1560099	ID000330/WA007624	56.8	23.6	47.5	76.4

LABNUM	VARIETY	TWT	% BRAN	% BREAK	POTENTIAL FY
1560100#	HYAK	56.3	25.8	50.4	74.2
1560101	OR845//HUNTSMAN/VH74521	55.9	24.9	50.1	75.1
1560102	OR845//HUNTSMAN/VH74521	56.5	23.3	49.8	76.7
1560103	OR845//HUNTSMAN/VH74521	57.8	23.9	47.5	76.1
1560104	OR845//HUNTSMAN/VH74521	57.4	23.3	48.7	76.7
1560105	OR845//HUNTSMAN/VH74521	56.7	25.1	48.3	74.9
1560106	OR845//HUNTSMAN/VH74521	56.1	26.1	49.4	73.9
1560107	OR00845/HYAK	56.5	24.7	48.6	75.3
1560108	OR00845/WA007624	55.9	24.8	49.6	75.2
1560109	OR00845/WA007624	55.2	22.7	49.9	77.3
1560110	ORFW0301/LEWJAIN	56.2	22.5	53.5	77.5
1560111	ORFW0301/MADSEN	56.6	22.9	50.9	77.1
1560112	ORFW03012/WA007627	53.9	23.8	50.4	76.2
1560113	ORFW03012/WA007627	55.3	24.8	52.3	75.2
1560114	ORFW03012/WA007627	55.9	24.7	52.2	75.3
1560115	MCVICAR/KMOR	54.9	22.3	51.5	77.7
1560116	MCVICAR/KMOR	53.6	24.1	50.1	75.9
1560117	MCVICAR/KMOR	55.0	23.9	53.1	76.1
1560118	MCVICAR/WA007627	-	23.2	50.9	76.8
1560119	MCVICAR/WA007627	54.4	26.0	49.2	74.0
1560120*	DAWS	58.4	28.0	45.0	72.0
1560121	MCVICAR/WA007627	56.2	24.4	47.3	75.6
1560122	MCVICAR/WA007627	57.8	23.8	51.4	76.2
1560123	MCVICAR/WA007627	55.7	26.0	48.2	74.0
1560124	MCVICAR/WA007627	57.8	22.2	49.2	77.8
1560125	MCVICAR/WA007627	55.1	23.5	50.3	76.5
1560126	MCVICAR/HYAK	55.8	22.6	49.6	77.4
1560127	MCVICAR/HYSLOP/CERCO	58.1	22.6	51.4	77.4
1560128	MCVICAR/WA007624	51.1	23.4	49.2	76.6
1560129	MCVICAR/WA007624	56.5	21.6	47.6	78.4
1560130	MCVICAR/WA007624	54.4	20.4	48.6	79.6
1560131	MCVICAR/WA007624	53.7	22.6	51.3	77.4
1560132	MCVICAR/WA007624	56.9	20.7	50.1	79.3
1560133	MCVICAR/WA007624	57.3	21.8	46.8	78.2
1560134	MCVICAR/WA007624	52.0	24.1	43.9	75.9
1560135	MCVICAR/WA007624	54.8	23.3	46.0	76.8
1560136	VH77353/JACHAR//DAWS	55.9	22.9	47.0	77.1
1560137	VH77353/JACHAR//MADSEN	54.7	24.0	51.1	76.0
1560138	VH77353/JACHAR//OR000843	57.2	25.8	47.2	74.2
1560139	VH77353/JACHAR//OR000843	54.6	20.3	51.9	79.7
1560140*	SPRAGUE	57.5	27.6	48.6	72.4
1560141	VH77353/JACHAR//OR000843	56.0	24.0	49.3	76.0
1560142	VH77353/JACHAR//WA007621	55.1	23.5	49.7	76.5
1560143	VH77353/JACHAR//OR000843	55.9	20.3	51.8	79.7
1560144	VH77353/JACHAR//WA007624	55.6	22.7	45.5	77.3
1560145	VH087450-LJN/ID232//DAWS	58.0	26.3	47.7	73.7
1560146	VH087450-LJN/ID232//DAWS	56.5	28.3	46.9	71.7
1560147	VH087450-LJN/ID232//DAWS	57.7	24.8	46.3	75.2
1560148	VH087450-LJN/ID232//DAWS	57.5	26.3	46.3	73.7
1560149	VH087450-LJN/ID232//KMOR	57.8	22.5	47.5	77.5

LABNUM	VARIETY	TWT	% BRAN	% BREAK	POTENTIAL FY
1560150	LEWJAIN/ID232//WA007628	57.6	22.0	47.2	78.0
1560151	LEWJAIN/ID232//WA007628	52.7	26.4	48.9	73.6
1560152	ELTAN//HUNTSMAN/VH74521	59.0	23.1	48.1	76.9
1560153	ELTAN//HUNTSMAN/VH74521	58.1	22.9	45.8	77.1
1560154	ELTAN//HUNTSMAN/VH74521	59.1	22.3	47.5	77.7
1560155	ELTAN//HUNTSMAN/VH74521	55.9	24.5	47.8	75.5
1560156	ELTAN//HUNTSMAN/VH74521	56.1	23.8	48.4	76.2
1560157	ELTAN/WA007628	59.3	20.6	49.4	79.4
1560158	ELTAN/WA007628	56.7	21.8	49.9	78.2
1560159	ELTAN/WA007621	58.8	24.8	40.3	75.2
1560160*	LEWJAIN	58.5	23.5	51.2	76.5
1560161	ELTAN/WA007624	56.5	22.0	49.6	78.0
1560162	ELTAN/WA007624	56.7	21.9	43.5	78.1
1560163	ELTAN/WA007624	55.4	22.9	43.5	77.1
1560164	ELTAN/WA007624	55.3	20.4	51.5	79.6
1560165	ELTAN/WA007624	57.5	21.3	45.0	78.7
1560166	ELTAN/WA007624	54.1	21.4	45.5	78.6
1560167	ELTAN/WA007624	57.4	18.1	49.1	81.9
1560168	ELTAN/WA007624	54.0	24.5	47.4	75.5
1560169	ELTAN/WA007624	55.4	24.0	47.9	76.0
1560170	VD084042/WA007628	57.8	21.8	48.5	78.2
1560171	VD084042/WA007628	57.7	22.1	53.4	77.9
1560172	VD084042/WA007628	57.4	20.6	51.6	79.4
1560173	VD084042/WA007628	57.0	23.0	52.5	77.0
1560174	VD084042/OR000855	57.5	22.6	50.3	77.4
1560175	VD084042/JACHAR	56.6	20.9	50.1	79.1
1560176	FRANDENMUTH/VH083021	58.0	20.0	50.4	80.0
1560177	VH085051/MHM/VH74521	54.8	26.7	49.0	73.3
1560178	VH085051/MHM/VH74521	54.7	25.2	49.6	74.8
1560179	VH085051/MHM/VH74521	55.0	23.6	50.4	76.4
1560180#	MORO	57.2	23.9	55.9	76.1
1560181	VH085051/MHM/VH74521	54.5	24.7	50.3	75.3
1560182	VH085051/MCVICAR	57.1	21.8	47.1	78.2
1560183	VH085051/MCVICAR	55.9	21.8	49.3	78.2
1560184	VH085051/MCVICAR	59.9	20.1	47.7	79.9
1560185	VH085051/MCVICAR	57.4	22.1	47.3	77.9
1560186	VH085051/MCVICAR	57.5	22.2	48.3	77.8
1560187	VH085051/MCVICAR	56.3	20.7	50.1	79.3
1560188	VH085051/MCVICAR	58.0	22.6	48.2	77.4
1560189	VH085051/MCVICAR	56.9	23.2	48.6	76.8
1560190	VH085051/MCVICAR	55.7	22.6	48.7	77.4
1560191	VH085051/WA007624	57.8	21.8	51.1	78.2
1560192	VH085051/WA007624	53.3	23.8	47.3	76.2
1560193	VH085051/WA007624	54.9	23.9	49.0	76.1
1560194	VH085051/WA007624	56.5	24.6	44.7	75.4
1560195	VH085051/WA007624	54.2	22.3	48.2	77.7
1560196	MT008219/AR876101	52.0	21.2	45.1	78.8
1560197	VH085051/WA007624	51.8	27.4	49.2	72.6
1560198	VH086204/HYAK	59.1	20.8	48.9	79.2
1560199	VH086204/HYAK	59.6	21.9	53.2	78.1

LABNUM	VARIETY	TWT	% BRAN	% BREAK	POTENTIAL FY
1560200#	HYAK	56.7	23.5	53.1	76.5
1560201	VH086204/HYAK	59.8	21.9	48.7	78.1
1560202	VH086204/WA007628	58.1	23.4	49.0	76.6
1560203	VH086204/WA007628	59.6	18.4	45.8	81.6
1560204	VH086204/WA007628	58.0	23.8	46.7	76.2
1560205	VH086204/WA007628	58.9	19.8	42.7	80.2
1560206	VH086204/WA007628	59.2	23.1	44.2	76.9
1560207	VH086204/WA007628	59.0	21.1	42.0	78.9
1560208	VH086204/WA007628	59.2	18.9	44.5	81.1
1560209	VH086204/MCVICAR	57.5	22.2	49.6	77.8
1560210	VH086204/MCVICAR	55.3	24.1	45.6	75.9
1560211	VH086204/MCVICAR	58.3	23.5	47.6	76.5
1560212	VH086204/WA007621	57.2	24.1	46.4	75.9
1560213	VH086204/WA007621	57.2	24.1	51.4	75.9
1560214	VH086204/WA007621	54.9	25.6	50.4	74.4
1560215	VH086204/WA007623	58.7	21.8	50.9	78.2
1560216	BOUNTY/VH79245//LEWJAIN	58.0	16.8	49.7	83.2
1560217	BOUNTY/VH79245//LEWJAIN	56.9	17.6	51.2	82.4
1560218	BOUNTY/VH79245//LEWJAIN	56.4	16.5	53.0	83.5
1560219	BOUNTY/VH79245//MADSEN	56.1	17.6	46.8	82.4
1560220*	DAWS	59.2	27.2	45.3	72.8
1560221	BOUNTY/VH79245//MADSEN	56.5	19.0	48.4	81.0
1560222	BOUNTY/VH79245//KMOR	55.5	27.1	50.3	72.9
1560223	BOUNTY/VH79245//WA007627	57.2	22.6	49.1	77.4
1560224	BOUNTY/VH79245//WA007627	56.8	21.2	50.3	78.8
1560225	BOUNTY/VH79245//WA007627	53.5	22.4	48.8	77.6
1560226	BOUNTY/VH79245//WA007627	55.9	24.4	48.0	75.6
1560227	BOUNTY/VH79245//HYAK	57.7	17.3	46.0	82.7
1560228	BOUNTY/VH79245//HYAK	59.4	22.8	51.1	77.2
1560229	BOUNTY/VH79245//HYAK	58.8	22.3	52.9	77.7
1560230	BOUNTY/VH79245//HYAK	56.7	19.7	49.3	80.3
1560231	BOUNTY/VH79245//HYAK	58.5	19.3	47.7	80.7
1560232	BOUNTY/VH79245//OR000843	56.2	20.0	49.7	80.0
1560233	BOUNTY/VH79245//OR000843	56.9	18.3	49.4	81.7
1560234	BOUNTY/VH79245//OR000843	58.2	20.0	42.9	80.0
1560235	BOUNTY/VH79245//OR000843	58.0	19.0	48.5	81.0
1560236	BOUNTY/VH79245//OR000843	57.7	20.1	45.4	79.9
1560237	MITHRAS/DAWS//OR000843	56.4	20.1	46.4	79.9
1560238	MITHRAS/DAWS//OR000843	57.9	18.5	48.1	81.5
1560239	MITHRAS/DAWS//OR000843	54.5	19.1	48.7	80.9
1560240*	SPRAGUE	57.5	27.5	48.7	72.5
1560241	MITHRAS/DAWS//WA007621	59.2	21.7	50.1	78.3
1560242	MITHRAS/DAWS//WA007621	59.6	21.6	51.7	78.4
1560243	MITHRAS/DAWS//WA007621	55.7	24.4	49.4	75.6
1560244	MITHRAS/DAWS//WA007621	56.9	25.1	48.1	74.9
1560245	VH086065/MADSEN	59.0	21.7	49.8	78.3
1560246	VH086065/MADSEN	57.3	23.2	49.9	76.8
1560247	VH086065/WA007627	56.8	23.4	51.1	76.6
1560248	VH086065//HYSLOP/CERCO	55.5	27.3	45.3	72.7
1560249	VH086065//HYSLOP/CERCO	55.7	22.2	42.2	77.8

LABNUM	VARIETY	TWT	% BRAN	% BREAK	POTENTIAL FY
1560250	VH086065/WA007621	55.6	23.9	52.0	76.1
1560251	VH086065/WA007621	57.1	27.4	47.3	72.6
1560252	VH086065/WA007621	55.9	27.3	44.4	72.7
1560253	JACHAR/SPRAGUE//LEWJAIN	52.8	25.3	54.4	74.7
1560254	JACHAR/SPRAGUE//ELGIN	55.2	26.0	53.8	74.0
1560255	JACHAR/SPRAGUE//HYAK	56.0	25.0	50.2	75.0
1560256	JACHAR/SPRAGUE//WA007628	54.6	22.7	52.9	77.3
1560257	JACHAR/SPRAGUE//WA007628	55.0	21.8	50.8	78.2
1560258	JACHAR/SPRAGUE//WA007628	55.2	22.6	52.1	77.4
1560259	JACHAR/SPRAGUE//WA007628	51.3	24.2	52.0	75.8
1560260*	LEWJAIN	60.5	23.8	50.6	76.2
1560261	JACHAR/SPRAGUE//WA007628	56.3	22.5	51.3	77.5
1560262	JACHAR/SPRAGUE//WA007628	54.1	22.2	52.5	77.8
1560263	JACHAR/SPRAGUE//WA007628	54.9	21.9	53.5	78.1
1560264	JACHAR/SPRAGUE//OR000855
1560265	JACHAR/SPRAGUE//OR000855	56.5	22.2	52.7	77.8
1560266	JACHAR/SPRAGUE//OR000855	57.5	22.9	54.3	77.1
1560267	JACHAR/SPRAGUE//WA006581	52.4	23.1	55.0	76.9
1560268	JACHAR/SPRAGUE//WA006581	52.8	25.4	52.0	74.6
1560269	JACHAR/SPRAGUE//WA006581	54.0	25.1	54.1	74.9
1560270	JACHAR/SPRAGUE//WA006581	52.9	21.9	55.6	78.1
1560271	JACHAR/SPRAGUE//WA006581	52.0	27.3	50.3	72.7
1560272	VD086008/MADSEN	55.8	24.4	48.9	75.6
1560273	VD086008/MADSEN	57.2	21.1	52.9	78.9
1560274	VD086008/ELGIN	55.7	23.6	55.7	76.4
1560275	VD086008/HYAK	58.0	22.2	52.1	77.8
1560276	VD086008/WA007628	59.8	22.3	48.6	77.7
1560277	VD086008/OR000855	56.1	22.4	51.6	77.6
1560278	VD086008/OR000855	55.4	25.3	48.9	74.7
1560279	VD086008/OR000855	57.3	24.0	49.5	76.0
1560280#	MORO	57.5	23.9	54.8	76.1
1560281	SPRAGUE/1D72001//MADSEN	58.0	23.4	49.8	76.6
1560282	SPRAGUE/1D72001//WA7627	56.1	24.5	44.7	75.5
1560283	SPRAGUE/1D72001//OR843	56.6	19.6	48.9	80.4
1560284	SPRAGUE/1D72001//OR843	54.7	22.8	42.4	77.2
1560285	SPRAGUE/1D72001//OR843	55.0	22.8	53.7	77.2
1560286	SPRAGUE/1D72001//OR843	56.1	21.1	53.0	78.9
1560287	SPRAGUE/1D72001//WA7621	57.9	25.5	52.0	74.5
1560288	VH086121/WA007621	54.5	28.4	51.7	71.6
1560289	VH086121/WA007623	55.9	27.6	48.1	72.4
1560290	VH086176/LEWJAIN	55.3	23.1	51.2	76.9
1560291	VH086176/LEWJAIN	54.7	23.9	51.6	76.1
1560292	VH086176/MADSEN	54.1	26.6	48.6	73.4
1560293	VH086176/MADSEN	55.9	19.5	51.7	80.5
1560294	VH086176/MADSEN	56.2	22.6	53.0	77.4
1560295	VH086176/MADSEN	55.6	23.2	50.1	76.8
1560296	VH086176/MADSEN	55.4	23.3	52.9	76.7
1560297	ROAZON/2*DAVS/3/KMOR	57.0	21.9	48.3	78.1
1560298	ROAZON/2*DAVS//WA007627	56.8	20.5	41.4	79.5
1560299	ROAZON/2*DAVS//HYAK	56.5	26.4	46.1	73.6

LABNUM	VARIETY	TWT	% BRAN	% BREAK	POTENTIAL FY
1560300#	HYAK	56.8	24.0	51.6	76.0
1560301	ROAZON/2*DAWS//OR000843	55.8	23.4	49.1	76.6
1560302	ROAZON/2*DAWS//WA007623	54.3	23.5	52.5	76.5
1560303	WA6814/TRES//MADSEN	59.9	22.6	47.7	77.4
1560304	WA6814/TRES//WA007628	56.9	21.5	51.2	78.5
1560305	WA6814/TRES//WA007622	55.2	22.1	53.0	77.9
1560306	WA6814/TRES//WA006581	57.8	22.2	50.4	77.8
1560307	WA6814/TRES//WA006581	56.2	21.0	53.0	79.0
1560308	WA6814/TRES//WA006581	56.8	23.6	50.9	76.4
1560309	WA6814/OR794//ELGIN	57.8	23.7	46.4	76.3
1560310	WA6814/OR794//TRES	58.3	24.3	51.4	75.7
1560311	WA6814/OR794//TRES	59.9	22.3	48.4	77.7
1560312	WA6814/OR794//TRES	59.2	23.4	46.9	76.6
1560313	WA6814/OR794//TRES	54.9	25.2	47.2	74.8
1560314	V8087008/WA007622	56.7	23.4	51.2	76.6
1560315	WA6814/OR794//JACMAR	58.4	22.4	49.9	77.6
1560316	WA6814/OR794//JACMAR	56.4	22.9	52.2	77.1
1560317	RZN/STEPHENS//2*LEWJAIN	57.5	24.4	46.2	75.6
1560318	RZN/SPN//LJN/3/MADSEN	56.2	23.9	48.4	76.1
1560319	RZN/SPN//LJN/3/MADSEN	54.9	23.5	46.1	76.5
1560320*	DAWS	59.1	29.4	42.0	70.6
1560321	RZN/SPN//LJN/3/MADSEN	53.3	30.5	48.6	69.5
1560322	RZN/SPN//LJN/3/WA007628	57.1	24.2	42.1	75.8
1560323	ORCW8635/DAWS	57.2	24.9	47.0	75.1
1560324	ORCW8635/MADSEN	58.4	22.8	48.9	77.2
1560325	ORCW8635/MADSEN	59.9	21.6	47.2	78.4
1560326	ORCW8635/WA007627	59.7	24.0	44.1	76.0
1560327	ORCW8635/WA007627	58.9	22.7	42.9	77.3
1560328	ORCW8635/WA007627	60.2	23.8	44.3	76.2
1560329	ORCW8635/WA007627	59.4	22.8	45.5	77.2
1560330	ELMO/TYEE//HYAK	57.6	25.6	43.3	74.4
1560331	ELMO/TYEE//WA007622	58.5	23.4	42.0	76.6
1560332	ELMO/TYEE//WA007622	57.4	24.1	43.8	75.9
1560333	ELMO/TYEE//WA007622	58.4	25.2	44.2	74.8
1560334	ELMO/TYEE//OR000855	58.9	27.2	43.8	72.8
1560335	ELMO/TYEE//OR000855	57.2	27.5	47.9	72.5
1560336	ELMO/TYEE//OR000855	58.4	26.0	46.0	74.0
1560337	WA6698/WA6581//LEWJAIN	58.9	26.5	44.8	73.5
1560338	WA6698/WA6581//HYAK	57.8	25.3	47.1	74.7
1560339	WA6698/WA6581//HYAK	57.6	24.8	41.9	75.2
1560340*	SPRAGUE	55.3	30.5	45.2	69.5
1560341	V8087153/WA007628	59.0	23.0	47.0	77.0
1560342	V8087153/WA007628	59.6	25.0	45.4	75.0
1560343	V8087153/WA007628	58.6	24.0	47.2	76.0
1560344	V8087153/WA007622	56.5	26.7	44.8	73.3
1560345	V8087153/WA007622	55.8	25.8	43.8	74.2
1560346	V8087153/WA006581		24.5	45.1	75.5
1560347	V8087153/WA006581	55.6	26.1	40.3	73.9
1560348	BARBEE/TYEE//MADSEN	55.7	24.6	47.5	75.4
1560349	BARBEE/TYEE//MADSEN	56.2	22.5	49.6	77.5

LABNUM	VARIETY	TWT	% BRAN	% BREAK	POTENTIAL FY
1560350	BARBEE/TYEE//MADSEN	55.4	26.6	45.5	73.4
1560351	BARBEE/TYEE//HYAK	54.5	25.5	48.8	74.5
1560352	BARBEE/TYEE//OR000855	58.5	25.2	47.4	74.8
1560353	BARBEE/TYEE//WA006581	60.0	24.2	44.9	75.8
1560354	VPM-1/MOS//HILL/3/DAWS	57.1	25.9	46.7	74.1
1560355	VPM1/MOS//HILL//MADSEN	58.8	23.8	45.6	76.2
1560356	VPM1/MOS//HILL/3/OR843	56.3	22.7	42.7	77.3
1560357	VPM1/MOS//HILL/3/WA7623	57.7	26.7	46.5	73.3
1560358	VPM1/MOS//HILL/3/WA7623	54.9	27.0	44.1	73.0
1560359	VH087268/MCVICAR	59.6	22.6	45.8	77.4
1560360*	LEWJAIN	59.4	25.1	47.6	74.9
1560361	VH087268/MCVICAR	55.8	23.6	47.1	76.4
1560362	VH087268/MCVICAR	56.3	21.6	47.1	78.4
1560363	VH087268/MCVICAR	56.9	27.2	45.0	72.8
1560364	WA6910/DAWS//LEWJAIN	56.5	24.7	45.3	75.3
1560365	WA6910/DAWS//MADSEN	58.3	24.6	45.9	75.4
1560366	WA6910/DAWS//MADSEN	52.7	25.3	44.0	74.7
1560367	WA6910/DAWS//MADSEN	55.3	25.9	44.4	74.1
1560368	WA6910/DAWS//MADSEN	56.0	28.1	46.3	71.9
1560369	WA6910/DAWS/3/KMOR	57.7	27.4	46.1	72.6
1560370	WA6910/DAWS//MCVICAR	54.0	27.7	44.2	72.3
1560371	WA6910/DAWS//WA007621	56.6	27.5	41.1	72.5
1560372	WA6910/DAWS//WA007621	58.1	27.1	43.6	72.9
1560373	WA6910/DAWS/4/MCVICAR	56.1	29.4	43.4	70.6
1560374	WA6910/DAWS//WA007624	55.5	28.0	40.4	72.0
1560375	WA6910/DAWS//WA007624	54.5	26.9	45.3	73.1
1560376	WA6910/DAWS//WA007624	53.1	27.8	46.6	72.2
1560377	WA6910/DAWS//WA007624	56.6	23.7	46.4	76.3
1560378	WA6910/DAWS//WA007624	57.9	24.3	47.2	75.7
1560379	WA6910/DAWS//WA007624	55.8	27.8	42.6	72.2
1560380#	MORO	56.7	26.0	51.9	74.0
1560381	WA6910/DAWS//WA007624	55.9	27.9	41.9	72.1
1560382	WA6910/DAWS//WA007624	56.3	25.6	47.1	74.4
1560383	WA6910/DAWS//WA007624	55.5	25.4	43.5	74.6
1560384	WA6910/DUSTY//LEWJAIN	57.7	25.0	44.2	75.0
1560385	WA6910/DUSTY//LEWJAIN	55.9	27.1	43.5	72.9
1560386	WA6910/DUSTY//LEWJAIN	57.7	25.4	41.8	74.6
1560387	WA6910/DUSTY//WA007627	59.7	25.3	45.9	74.7
1560388	WA6910/DUSTY//WA007627	56.8	27.0	46.8	73.0
1560389	WA6910/DUSTY//WA007627	56.9	25.7	48.0	74.3
1560390	WA6910/DUSTY//WA007627	55.2	24.8	48.3	75.2
1560391	WA6910/DUSTY//HYAK	57.8	24.7	46.0	75.3
1560392	WA6910/DUSTY//HYAK	58.5	25.8	44.7	74.2
1560393	WA6910/DUSTY//MCVICAR	54.5	25.0	50.3	75.0
1560394	WA6910/DUSTY//MCVICAR	57.6	27.1	46.3	72.9
1560395	WA6910/DUSTY//MCVICAR	54.7	26.3	50.2	73.7
1560396	WA6910/DUSTY//WA007621	57.1	25.7	49.0	74.3
1560397	WA6910/DUSTY//WA007624	54.5	27.2	45.1	72.8
1560398	WA6910/DUSTY//WA007624	54.2	25.2	49.8	74.8
1560399	WA6910/DUSTY//WA007624	53.6	27.5	45.1	72.5

LABNUM	VARIETY	TWT	% BRAN	% BREAK	POTENTIAL FY
1560400#	HYAK	57.2	25.2	50.1	74.8
1560401	WA6910/DUSTY//WA007624	55.2	25.9	51.1	74.1
1560402	VM087509-WV047/LEWJAIN	56.0	24.1	50.8	75.9
1560403	VM087509-WV047/LEWJAIN	55.5	24.2	50.6	75.8
1560404	VM087509-WV047/MADSEN	53.3	24.8	54.0	75.2
1560405	VM087509-WV047/MADSEN	56.5	24.4	50.1	75.6
1560406	VM087509-WV047/3/KMOR	54.7	23.8	52.8	76.2
1560407	VM087509-WV047/3/KMOR	55.3	25.2	52.9	74.8
1560408	VM087509-WV047//WA007627	53.6	26.1	49.9	73.9
1560409	VM087509-WV047/HYAK	56.6	22.8	52.6	77.2
1560410	VM087509/MCVICAR	52.8	23.6	53.5	76.4
1560411	VM087509/MCVICAR	53.2	24.2	52.4	75.8
1560412	VM087509/MCVICAR	53.9	24.2	51.2	75.8
1560413	VM087509/MCVICAR	54.7	23.0	53.4	77.0
1560414	VM087509/WA007621	56.5	24.4	50.8	75.6
1560415	VM087509/3//SPN/RZN/101	50.5	27.1	50.1	72.9
1560416	VM087509/3//SPN/RZN/101	56.7	23.0	50.8	77.0
1560417	VM087509/3//SPN/RZN/101	58.3	22.3	50.0	77.7
1560418	VM087509/3//SPN/RZN/101	51.3	26.8	50.0	73.2
1560419	VM087509/3//SPN/RZN/101	57.1	21.7	49.2	78.3
1560420*	DAVS	58.4	26.9	45.7	73.1
1560421	VM087509/3//SPN/RZN/101	56.7	24.1	46.8	75.9
1560422	VM087512-WVP118/MADSEN	52.2	22.9	53.8	77.1
1560423	VM087512-WVP118/HYAK	53.4	25.6	49.8	74.4
1560424	VM087512-WVP118/HYAK	53.9	28.2	46.6	71.8
1560425	VM087512-WVP118/HYAK	55.4	23.8	53.1	76.2
1560426	VM087512-WVP118/HYAK	54.5	24.4	46.7	75.6
1560427	VM087512/MCVICAR	56.0	24.0	50.9	76.0
1560428	VM087512/MCVICAR	54.7	20.9	49.0	79.1
1560429	VM0875128/3/SPN/RZN/S101	57.3	29.2	46.0	70.8
1560430	VM087512/WA007624	56.2	24.5	50.3	75.5
1560431	ORCR8313/MADSEN	56.6	24.6	51.6	75.4
1560432	ORCR8313/MCVICAR	57.4	23.4	48.9	76.6
1560433	ORCR8313/SPN/RZN/101	57.6	18.1	49.1	81.9
1560434	BUCKSKIN/10076//MADSEN	59.2	24.0	44.6	76.0
1560435	BUCKSKIN/10076//OR843	57.4	19.3	39.4	80.7
1560436	WA007626/MADSEN	57.3	24.0	52.6	76.0
1560437	WA007626/MADSEN	55.9	19.8	52.3	80.2
1560438	WA007626/NE87U120	57.1	22.7	45.8	77.3
1560439	VORO/NIMROD//DUSTY	56.1	22.1	49.9	77.9
1560440*	SPRAGUE	57.9	27.9	49.5	72.1
1560441	VORO/NIMROD//DUSTY	57.5	19.0	51.5	81.0
1560442	VORO/NIMROD//WA007627	57.3	19.1	48.2	80.9
1560443	VORO/NIMROD//NE87U107	57.0	17.2	52.1	82.8
1560444	VORO/NIMROD//NE87U117	57.2	17.8	52.3	82.2
1560445	QUANTUM-555//WA007627	58.6	17.9	44.3	82.1
1560446	QUANTUM-555//WA007627	59.3	18.5	49.2	81.5
1560447	QUANTUM-555/MCVICAR	57.8	22.7	51.0	77.3
1560448	QUANTUM-555/MCVICAR	58.1	24.0	47.0	76.0
1560449	QUANTUM-555/MCVICAR	58.1	23.1	51.5	76.9

LABNUM	VARIETY	TWT	% BRAN	% BREAK	POTENTIAL FY
1560450	QUANTUM-555/MCVICAR	50.3	27.0	50.0	73.0
1560451	RENARD//HSYLOP/CERCO	58.9	23.9	42.8	76.1
1560452	RENARD//HSYLOP/CERCO	59.0	23.6	44.4	76.4
1560453	JACMAR/WA007628	52.5	23.1	52.0	76.9
1560454	JACMAR/VD084042	55.8	24.0	51.7	76.0
1560455	JACMAR/VB087008	55.3	23.0	52.3	77.0
1560456	JACMAR/VB087009	53.1	23.9	51.6	76.1
1560457	JACMAR/VB087009	56.5	21.2	50.7	78.8
1560458	JACMAR/VD087011	55.0	22.3	51.1	77.7
1560459	FRANDENMUTH/WA007628	56.4	21.8	47.9	78.2
1560460*	LEWJAIN	59.3	22.0	52.7	78.0
1560461	AUS18446/MCVICAR	60.0	23.5	50.8	76.5
1560462	AUS18446/3/SPN/RZN/101	59.3	21.5	50.9	78.5
1560463	NE87U107/VH087312	58.4	17.3	45.4	82.7
1560464	NE87U107//LJN/1D745318	57.5	18.0	52.6	82.0
1560465	NE87U108/VH087225	57.5	17.2	47.6	82.8
1560466	NE87U108//LJN/1D745318	56.8	25.9	45.4	74.1
1560467	NE87U108/REA87786	59.8	18.5	50.8	81.5
1560468	NE87U108/REA87786	60.1	19.3	49.1	80.7
1560469	NE87U108/REA87792	58.7	18.8	52.4	81.3
1560470	NE87U108/RE869471	59.1	18.9	47.8	81.1
1560471	NE87U108/RE869499	55.9	20.0	51.8	80.0
1560472	NE87U108//N8703501	57.3	20.5	49.9	79.5
1560473	NE87U120//LJN/1D745318	57.9	24.2	46.1	75.8
1560474	NE87U120//BURT*4/TH	56.8	18.7	48.6	81.3
1560475	MACHETE/N8703501	57.4	22.4	52.7	77.6
1560476	MACHETE/N8703501	55.3	23.8	52.3	76.2
1560477	V8088005/BARBEE/TYEE	55.7	23.0	50.3	77.0
1560478	Tres/Jacmar//BRB/TYEE	54.8	24.0	52.6	76.0
1560479	Tres/Jacmar//BRB/TYEE	51.1	26.0	51.1	74.0
1560480#	MORO	56.5	23.2	56.7	76.8
1560481	101/LEWJAIN//MADSEN	57.2	22.1	49.6	77.9
1560482	101/LEWJAIN//MADSEN	.	22.0	50.2	78.0
1560483	101/LEWJAIN//HYAK	.	24.7	44.2	75.3
1560484	101/LEWJAIN//HYAK	.	25.0	44.4	75.0
1560485	LEWJAIN/WA6910//MADSEN	.	22.5	48.4	77.5
1560486	LEWJAIN/WA6910//MADSEN	.	24.1	46.3	75.9
1560487	LEWJAIN/WA6910//MADSEN	.	23.7	50.0	76.3
1560488	LEWJAIN/WA6910//MADSEN	.	22.8	48.2	77.2
1560489	LEWJAIN/WA6910//MADSEN	.	22.6	47.7	77.4
1560490	LEWJAIN/WA6910//MADSEN	.	20.3	54.1	79.7
1560491	VH088136/MADSEN	.	18.3	48.2	81.7
1560492	VH088136/DAWS	59.6	24.3	46.3	75.7
1560493	VH088136/HYAK	55.0	23.6	51.4	76.4
1560494	101/ANZA//DAWS/3/MADSEN	57.2	21.5	54.2	78.5
1560495	101/ANZA//DAWS/3/MADSEN	59.4	24.1	48.7	75.9
1560496	DUSTY/WA007050//MADSEN	55.7	21.9	52.7	78.1
1560497	VH088275/OVESEN	57.3	23.3	43.4	76.7
1560498	VH088337/MADSEN	56.5	24.3	51.0	75.7
1560499	VH088337/MADSEN	57.1	21.9	49.0	78.1

LABNUM	VARIETY	TWT	% BRAN	% BREAK	POTENTIAL FY
1560500#	HYAK	57.0	22.6	54.1	77.4
1560501	VH088337/MADSEN	57.7	23.3	49.6	76.7
1560502	VH088337/MADSEN	57.3	24.4	52.5	75.6
1560503	VH088471/LEWJAIN	57.9	24.9	46.0	75.1
1560504	VH088546/LEWJAIN	57.4	24.7	49.2	75.3
1560505	VH088546/LEWJAIN	58.4	23.1	49.7	76.9
1560506	VH088546/DAWS	56.2	23.4	56.2	76.6
1560507	VH088546/DAWS	55.9	26.3	48.4	73.7
1560508	VH088546/DAWS	55.8	23.8	51.9	76.2
1560509	NE87U108/ID000330//DAWS	57.3	26.4	45.4	73.6
1560510	NE87U108/ID000330//DAWS	56.3	27.9	44.9	72.1
1560511	NE87U108/ID000330//DAWS	57.6	25.2	51.4	74.8
1560512	NE87U108/ID000330//DAWS	56.8	26.4	48.6	73.6
1560513	NE87U108/ID000330//DAWS	57.4	27.0	47.5	73.0
1560514	NE87U108/ID000330//DAWS	56.9	26.6	50.6	73.4
1560515	NE87U108/ID000330//DUSTY	56.9	29.6	44.8	70.4
1560516	NE87U108/ID000330//DUSTY	52.8	24.6	47.5	75.4
1560517	NE87U108/ID000330//DUSTY	51.1	25.1	47.5	74.9
1560518	NE87U108/ID000330//DUSTY	53.9	24.3	47.8	75.7
1560519	NE87U108/ID000330//DUSTY	58.4	23.3	51.5	76.7
1560520*	DAWS	57.9	28.0	45.9	72.0
1560521	NE87U108/ID000330//DUSTY	56.2	27.2	45.6	72.8
1560522	NE87U108/ID000330//DUSTY	57.0	24.2	51.9	75.8
1560523	NE87U108/ID000330//DUSTY	56.3	29.2	46.6	70.8
1560524	NE87U108/ID000330//DUSTY	54.6	27.8	46.9	72.2
1560525	NE87U108/ID000330//DUSTY	56.8	26.0	46.7	74.0
1560526	NE87U109/MADSEN//DAWS	56.0	25.8	48.7	74.2
1560527	NE87U109/MADSEN//DAWS	57.4	25.7	49.2	74.3
1560528	NE87U109/MADSEN//DAWS	57.8	22.0	48.8	78.0
1560529	NE87U109/MADSEN//DAWS	56.5	21.6	47.8	78.4
1560530	NE87U109/MADSEN//DAWS	55.7	25.6	48.9	74.4
1560531	#N/AI	56.4	25.0	50.8	75.0
1560532	UN-(NS18-71)/4/ORCW8521	58.4	21.6	52.8	78.4
1560533	ZITNIC-(NS-18-99)/WA7216	57.7	18.1	49.3	81.9
1560534	VT082805//BOKOLO/WHIT	43.7	28.1	38.7	71.9
1560535	VT082805/AR876101	51.1	27.5	42.8	72.5
1560536	VT082805/AR876101	48.7	26.1	46.0	73.9
1560537	VT082831//BOKOLO/WHIT	53.2	25.0	40.1	75.0
1560538	VT082831//BOKOLO/WHIT	51.3	25.1	48.8	74.9
1560539	GK-SAGVAR1/WA007216	53.2	24.5	49.4	75.5
1560540*	SPRAGUE	55.8	29.6	48.3	70.4
1560541	MT36/WHIT//VT086493	47.9	29.3	41.6	70.7
1560542	GK-SAGVAR1/ORCW8521	57.0	23.9	48.4	76.1
1560543	MT8219//AR876101	41.1	37.5	44.0	62.5
1560544	REGINA//ID330-NLY/2*SPN	52.9	27.5	53.7	72.5
1560545	MT84835/VT086493	44.2	35.6	34.8	64.4
1560546	MT84835/ARC19447	47.7	31.7	43.6	68.3
1560547	MT84835/ARC19447	48.5	32.1	43.5	67.9
1560548	MT84835/AR876101	47.5	32.8	41.1	67.2
1560549	JOSS0544/WA007432	56.3	19.5	50.5	80.5

LABNUM	VARIETY	TWT	% BRAN	% BREAK	POTENTIAL FY
1560550	OWCB168/MADSEN	55.4	23.5	52.7	76.5
1560551	OWCB168/ORCW8521	57.3	25.4	47.4	74.6
1560552	OWCB168/ORCW8521	56.4	26.3	46.5	73.7
1560553	FRANDENMUTH/MADSEN	55.4	25.4	53.2	74.6
1560554	FRANDENMUTH/WAO07216	55.7	25.2	51.6	74.8
1560555	FRANDENMUTH/ORCW8521	57.4	24.7	51.4	75.3
1560556	FRANDENMUTH/LJN/AMIGO13	55.4	21.8	48.2	78.2
1560557	BRIMSTONE/WAO07432	57.2	18.8	45.6	81.2
1560558	BROCK/KMOR	55.0	24.3	48.1	75.7
1560559	NFC84-84D/MHM/VH74521	57.5	19.0	41.6	81.0
1560560*	LEWJAIN	59.7	23.4	52.0	76.6
1560561	NFC84-84D/MHM/VH74521	56.2	25.8	43.5	74.2
1560562	NFC84-84D/ID000330	56.2	23.6	51.4	76.4
1560563	NFC36-84A/MADSEN	53.8	25.9	49.7	74.1
1560564	NFC160-85/MADSEN	52.4	24.0	53.2	76.0
1560565	NFC160-85/MADSEN	50.1	28.6	50.7	71.4
1560566	BAYONET/MADSEN	56.4	22.9	51.4	77.1
1560567	BAYONET/WAO07528	59.7	18.2	48.4	81.8
1560568	NEB7U108/ID330-NLY/2*SPN	58.9	18.7	45.6	81.3
1560569	DUSTY/MADSEN	56.1	27.7	50.4	72.3
1560570	DUSTY/MADSEN	55.4	26.4	54.0	73.6
1560571	DUSTY/MADSEN	53.9	26.3	52.3	73.7
1560572	DUSTY/MADSEN	55.2	27.2	49.3	72.8
1560573	DUSTY/MADSEN	53.2	29.6	49.8	70.4
1560574	DUSTY//LEWJAIN/AMIGO-13	55.4	25.5	52.9	74.5
1560575	TRES/MADSEN	54.0	23.9	52.5	76.1
1560576	TRES/MADSEN	55.3	24.4	53.2	75.6
1560577	TRES/KMOR	54.5	22.1	57.0	77.9
1560578	VD084042//MHM/VH74521	54.7	25.2	53.9	74.8
1560579	VC084070/WAO07216	50.7	28.8	46.1	71.2
1560580#	MORO	56.8	23.4	56.3	76.6
1560581	VC084070//MHM/VH74521	50.6	26.2	47.7	73.8
1560582	VC084070//MHM/VH74521	55.0	20.7	45.7	79.3
1560583	VC084070//MHM/VH74521	53.7	21.3	52.3	78.7
1560584	VH084437//MHM/VH74521	55.9	26.9	47.9	73.1
1560585	VH78121/LEWJAIN//KMOR	58.6	21.2	50.3	78.8
1560586	VH78121/LEWJAIN//KMOR	57.7	21.1	49.5	78.9
1560587	VH78121/LEWJAIN//KMOR	58.7	21.9	50.8	78.1
1560588	VH78121/LEWJAIN//KMOR	58.7	21.3	46.6	78.7
1560589	VH78121/LJN//VH083021	57.3	25.3	47.8	74.7
1560590	VH082253/MADSEN	55.3	21.6	52.1	78.4
1560591	VH082253/MADSEN	57.3	22.2	49.6	77.8
1560592	VH082253/MADSEN	56.1	21.8	50.0	78.2
1560593	VH082253/MADSEN	56.1	25.9	45.6	74.1
1560594	VH082253/LJN/AMIGO-13	57.9	23.4	48.7	76.6
1560595	VJ085141/WAO07216	54.0	24.5	50.4	75.5
1560596	VJ85141//ID330-NLY/2*SPN	55.8	23.9	49.5	76.1
1560597	SENTRY/LEWJAIN//MADSEN	57.8	17.2	49.5	82.8
1560598	SENTRY/LEWJAIN//MADSEN	57.3	21.9	50.4	78.1
1560599	SENTRY/LEWJAIN//MADSEN	58.1	22.3	49.3	77.7

LABNUM	VARIETY	TWT	% BRAN	% BREAK	POTENTIAL FY
1560600#	HYAK	56.7	23.5	53.3	76.5
1560601	SENTRY/LEWJAIN//WA007216	57.3	22.3	43.3	77.7
1560602	SENTRY/LEWJAIN//WA007432	57.4	24.0	50.8	76.0
1560603	SENTRY/LEWJAIN//WA007433	58.8	18.5	45.1	81.5
1560604	SENTRY/LEWJAIN//ID000330	56.8	26.4	48.6	73.6
1560605	SENTRY/LEWJAIN//ID000330	52.6	26.7	47.5	73.3
1560606	SENTRY/LEWJAIN//ID000330	54.5	21.2	48.6	78.8
1560607	SENTRY/LEWJAIN//ORCW8521	53.0	29.6	47.8	70.4

*SWW Standard #CLUB Standard

Standard mean	CLUB	56.8	24.2	53.5	78.8
Standard mean	SWW	58.2	26.9	47.7	73.1
Nursery mean		55.7	24.0	48.4	76.0
Nursery standard mean		4.8	2.8	3.5	2.8

COMMENTS: This nursery was milled on the Short Flour Quadrumat milling system. Wheat was ground only through the Quadrumat break head rolls. Reported data were Test Weight, % Bran, % Bran, % Break Flour Yield, and % Potential Flour Yield. No reduction of middling stock was done. Reported data is defined below:

TWT: Test weight

% Bran: The percent by weight of the total products recovered as bran.

% Break Flour: The percent by weight of the total products recovered as flour off the break rolls.

% Potential Flour Yield: The percent by weight of the total products recovered as break flour and unground middling stock.

The following LABNUM's have missing data or only partial data:

LABNUM

921560044	No milling data
921560118	No test weight
921560264	No data
921560346	No test weight
921560428	No test weight
921560482 - 1560491	No test weight

SAMPLE#	VARIETY	BREEDER#	CLASS	LOCATION	NIRWPROT	UNHRD	WPROT	TWT	DWT	OVENWMT	WMIST	DSI
0001	KLASIC	TRISTATE	HWS	PULLMAN	11.1	30	10.8	58.3	10.7	9.77	9.8	0.119
0002	KLASIC	TRISTATE	HWS	LIND	14.9	34	14.5	57.7	5.2	9.77	9.8	0.048
0003	KLASIC	TRISTATE	HWS	R.SLOPE	12.8	42	12.5	60.3	5.5	10.0	10.0	1.810
0004	ID377M	TRISTATE	HWS	PULLMAN	12.4	46	12.1	61.5	11.6		9.8	0.104
0005	ID377M	TRISTATE	HWS	LIND	15.9	43	15.5	57.8	5.5		9.8	0.052
0006	ID377M	TRISTATE	HWS	R.SLOPE	11.7	60	11.4	62.8	6.8		9.8	0.103
0007	ID377T	TRISTATE	HWS	PULLMAN	11.5	51	11.2	61.8	10.7		9.8	0.050
0008	ID377T	TRISTATE	HWS	LIND	16.4	58	16.0	57.3	5.2		9.8	0.045
0009	ID377T	TRISTATE	HWS	R.SLOPE	12.1	59	11.8	62.3	7.2		9.8	0.059
0010	KLASIC	COMM	HWS	PULLMAN	12.9	36	12.6	56.1	9.9		9.8	0.152
0011	KLASIC	COMM	HWS	LIND	14.4	46	14.0	58.0	5.7		9.8	0.057
0012	KLASIC	COMM	HWS	R.SLOPE	13.6	39	13.3	60.6	8.8		9.8	1.000
0013	KLASIC	COMM	HWS	MAYVIEW	12.0	36	11.7	57.1	9.9		9.8	0.276
0014	KLASIC	COMM	HWS	REARDAN	13.2	48	12.9	62.7	9.0		9.8	0.091
0015	KLASIC	COMM	HWS	FAIRFIELD	13.2	41	12.9	59.9	9.0		9.8	0.078
0016	ID377S	COMM	HWS	PULLMAN	13.0	48	12.7	60.7	10.1		9.8	0.054
0017	ID377S	COMM	HWS	LIND	16.1	53	15.7	58.2	5.0		9.8	0.062
0018	ID377S	COMM	HWS	R.SLOPE	12.5	54	12.2	62.7	10.1		9.8	0.119
0019	ID377S	COMM	HWS	MAYVIEW	12.2	56	11.9	59.6	9.9		9.8	0.071
0020	ID377S	COMM	HWS	REARDAN	12.9	59	12.6	63.9	10.3		9.8	0.072
0021	ID377S	COMM	HWS	FAIRFIELD	13.7	55	13.4	61.4	9.6		9.8	0.034

* = standard mean nursery flour protein = mill used = Quad

SAMPLE#	VARIETY	CLASS	LOCATION	TWT	WMIST	NIRWROT	UMHRD	WPROT	DSI	DWT
0001	FEDERATION	SWS	ABERDEEN	60.1	10.2	11.0	25	10.8	0.184	35
0002	KLASIC	HWS	ABERDEEN	57.8	10.5	14.3	41	14.1	0.052	104
0003	ID0377S	HWS	ABERDEEN	58.5	10.2	13.8	56	13.5	0.048	103
0004	ID0377M	HWS	ABERDEEN	58.7	10.3	14.6	61	14.3	0.056	103
0005	ID0377I	HWS	ABERDEEN	58.2	10.3	14.3	59	14.0	0.067	104
0006	ID355HW 1991 & 1992-4 IDAHO LOCATIONS	HWM	COMPOSITE	61.0	10.3	14.3	70	14.0	0.051	82

COMMENTS: Limited quality parameter data was collected for SWS, HWS and HWM lines grown at Southern Idaho locations. This data was useful for screening the material and beneficial in making decisions as to what nurseries and/or locations could be combined to make appropriate grain composites to be tested in the 1992 Hard White Overseas Collaborative program. See Nurs. 125 for the milling and baking quality parameters of the thirteen lines shipped overseas for collaborative testing.

SAMPLE#	VARIETY	CLASS	LOCATION	TWT	WMIST	NIRWPROT	UWHRD	WPROT	DSI	DWT
0001	KLASIC	HWS	PENDLETON	63.7	10.7	13.1	55	12.9	0.059	86
0002	KLASIC	HWS	W. EMPIRE	60.7	11.3	11.6	52	11.5	0.109	17
0003	OR487279	HWS	PENDLETON	63.6	9.1	13.7	60	13.3	0.054	138
0004	ORS8413	HWS	PENDLETON	62.4	10.3	13.0	58	12.8	0.062	56
0005	ORS8413	HWS	W. EMPIRE	59.9	10.3	10.1	70	9.9	0.067	19
0006	OR850513	HW	PENDLETON	59.9	10.3	10.1	53	9.9	0.040	13
0007	OR850513	HW	CHAMBERS	64.0	10.3	10.0	73	9.8	0.030	62
0008	WA7679	HW	CHAMBERS	61.9	10.3	9.6	54	9.4	1.000	14
0009	ID355	HW	CHAMBERS	63.1	10.3	10.2	71	10.0	0.125	15

COMMENTS: Limited quality parameter data was collected for HWS and HW lines grown at several Oregon locations. This data was useful for screening the material and beneficial in making decisions as to what nurseries and/or locations could be combined to make appropriate grain composites to be tested in the 1992 Hard White Overseas Collaborative program. See Nurs. 125 for the milling and baking quality parameters of the thirteen lines shipped overseas for collaborative testing.

SAMPLE#	VARIETY	CLASS	LOCATION	TWT	WMIST	NIRWPROT	UMHRD	WPROT	DSI	DWT
0001	KLASIC	HWS	DAYTON	58.2	9.4	11.8	38	11.5	0.153	4.0
0002	KLASIC	HWS	LAMONT	55.8	9.1	15.0	28	14.5	0.238	1.3
0003	KLASIC	HWS	DUSTY	51.4	9.3	13.5	40	13.1	0.125	1.8
0004	KLASIC	HWS	ST. JOHN	57.2	9.3	13.4	30	13.0	0.099	2.2
0005	KLASIC	HWS	BICKLETON	58.9	9.3	15.3	41	14.8	0.066	2.0
0006	KLASIC	HWS	FARMINGTON	58.2	9.3	14.1	42	13.7	0.061	4.8
0007	KLASIC	HWS	MOSES LK	52.9	9.3	13.9	23	13.5	0.656	5.1
0008	KLASIC DRILL '92	HWS	PULLMAN	59.2	9.3	13.0	38	12.6	0.078	16.5
0009	WA7679	HW	DAYTON	58.2	9.3	11.5	52	11.2	0.130	6.8
0010	WA7679	HW	LAMONT	6.83	9.3	12.7	55	12.3	0.112	2.8
0011	WA7679	HW	DUSTY	56.1	9.3	12.0	57	11.6	0.166	4.6
0012	WA7679	HW	ST. JOHN	56.9	9.3	15.2	62	14.7	0.310	6.3
0013	WA7679	HW	REARDAN	57.7	9.3	12.2	56	11.8	0.128	7.3
0014	WA7679	HW	FAIRFIELD	58.6	9.3	10.1	49	9.8	0.414	3.7
0015	WA7679	HW	ASOTTIN	57.2	9.3	15.6	49	15.1	0.064	2.1
0016	WA7679	HW	BICKLETON	57.5	9.3	8.9	46	8.6	0.092	3.4
0017	WA7679	HW	FARMINGTON	57.1	9.3	13.4	53	13.0	0.329	6.0
0018	WA7679	HW	MAYVIEW	58.0	9.3	12.1	52	11.7	0.244	6.3
0019	WA7679	HW	MOSES LK	58.2	9.3	13.8	58	13.4	1.340	9.6

COMMENTS: Limited quality parameter data was collected for these HWS and HW lines grown in the Washington Variety Trial nurseries from several locations. This data was useful for screening the material and beneficial in making decisions as to what nurseries and/or locations could be combined to make appropriate grain composites to be tested in the 1992 Hard White Overseas Collaborative program. See Nurs. 125 for the milling and baking quality parameters of the thirteen lines shipped overseas for collaborative testing.

SAMPLE#	VARIETY	CLASS	LOCATION	TWT	WMIST	MIRMPROT	UMHRD	WPROT	DSI	DWT
0001	KLASIC 1991	HWS	ST. JOHN	61.4	9.7	12.4	47	12.1	0.055	14.7
0002	KLASIC 1991	HWS	DAYTON	9.3	10.0	11.6	30	11.3	0.048	15.3
0003	KLASIC 1991	HWS	53	60.6	9.9	14.2	48	13.9	0.069	42.0
0004	KLASIC 1991	HWS	LAMONT	57.4	9.9	11.2	43	10.9	0.036	14.6
0005	KLASIC 1991	HWS	DUSTY	55.9	9.9	14.4	30	14.1	0.035	11.8
0006	KLASIC 1991	HWS	FARMINGTON	60.2	9.9	11.8	41	11.5	0.049	22.3
0007	KLASIC 1991	HWS	DEEP CREEK	58.3	9.9	15.5	51	15.1	0.045	22.3

COMMENTS: Limited quality parameter data was collected for these Klasic samples grown at several Washington locations. This data was useful for screening the material and beneficial in making decisions as to what nurseries and/or locations could be combined to make appropriate grain composites to be tested in the 1992 Hard White Overseas Collaborative program. See Nurs. 125 for the milling and baking quality parameters of the thirteen lines shipped overseas for collaborative testing.

SAMPLE#	VARIETY	BREEDER#	CLASS	LOCATION	TWT	NIRUPROT	UWHRD	DWT
0001	WA7679		HMW	CONNELL	58.9	11.4	74	60.0
0002	WA7679		HMW	LIND	30.0	17.0	95	30.0

COMMENTS: Limited quality parameter data was collected for two WA7679 samples grown at Connell and Lind, WA. This data was useful for screening the material and beneficial in making decisions as to what nurseries and/or locations could be combined to make appropriate grain composites to be tested in the 1992 Hard White Overseas Collaborative program. The WA7679 sample from Connell was used to make up a composite. The WA7679 sample from Lind had extremely high wheat protein (undesirable) and was not used. See Nurs. 125 for the milling and baking quality parameters of the thirteen lines shipped overseas for collaborative testing.

SAMPLE#	VARIETY	BREEDER#	CLASS	TWT	UMHRD	WPROT	FYELD	BFYELD	FASH	MSCOR	FPROT	MABS
0001	ID377S	9201	HWS	61.5	77	13.3	65.5	9.9	0.42	72.2	12.2	63.8
0002	KLASIC 1	9202	HWS	60.1	55	13.5	69.2	10.6	0.44	76.6	12.6	65.3
0003	OR487279	9203	HWS	63.7	75	12.9	72.2	11.9	0.38	85.3	12.1	64.2
0004	ID377M	9204	HWS	61.1	81	13.3	68.0	8.8	0.45	74.9	12.2	63.8
0005	ID377T	9205	HWS	60.8	80	13.4	66.9	8.7	0.46	74.2	12.1	64.1
0006	ID355	9206	HWS	62.6	97	12.4	68.2	10.6	0.40	78.6	11.5	63.7
0007	KLASIC 2	9207	HWS	62.9	83	12.6	72.3	9.9	0.33	86.6	12.0	64.7
0008	KLASIC 3	9208	HWS	62.6	60	12.0	70.6	10.0	0.35	81.5	11.6	62.3
0009	OR850513	9209	HWS	65.3	55	9.9	71.9	11.7	0.37	84.9	9.4	59.7
0010	WA7679	9210	HWS	60.8	76	10.2	70.2	11.8	0.37	82.1	9.5	60.6
0011	FEDERATION	9211	SWS	61.5	30	10.9	69.7	15.0	0.37	79.5	9.4	56.4
0012	KLASIC 4 HI-PRO	9212	HWS	60.1	63	13.6	69.6	11.3	0.34	81.0	12.9	63.4
0013	ORS8413	9213	HWS	63.3	76	11.4	70.7	10.4	0.36	83.5	10.6	63.6

mill used = Buhler

SAMPLE#	BREEDER#	MTYPE	BABS	MTIME	LVOL	BCRGR	PROQ	RVA	COLOR
0001	9201	5H	65.0	4.1	945	4	0	253	Q
0002	9202	6H	67.5	5.3	1050	4	+1	259	Q
0003	9203	4H	66.4	4.1	1030	3	+1	250	Q
0004	9204	4H	67.0	3.6	975	4	+1	242	Q
0005	9205	4H	66.3	4.4	950	5	0	247	S
0006	9206	3H	67.4	3.1	890	6	0	137	S
0007	9207	6H	67.9	5.3	1045	4	+1	213	Q
0008	9208	6H	64.5	6.1	995	5	+1	252	Q
0009	9209	5H	63.9	3.3	805	7	+1	170	S
0010	9210	7H	63.8	4.0	825	7	+1	146	S
0011	9211	2H	56.6	1.0	695	7	-1	141	U
0012	9212	6H	65.6	6.1	1070	4	+1	239	Q
0013	9213	5H	66.8	4.0	885	6	+1	167	S

mill used = Buhler

COMMENTS: In 1992, the Western Wheat Quality Laboratory and the U.S. Wheat Associates cooperatively established a program for the overseas evaluation of promising hard white breeding lines. This collaborative program is to provide feedback on the strengths and weaknesses of individual breeding lines, as well as specific methodology and other information for noodle evaluation and guidelines for assessing flour performance. Lines were submitted by breeders after solicitation for entries. The origin of wheat used in making up of composites for the selections in this nursery are listed below (see the following nurseries for this information).

Nursery	Nursery Identification	Location	Breeder
082	Hard White Overseas Testing	various-WA	C.F. Konzak
083	Hard White Overseas Testing	Aberdeen, ID	E. Souza
084	Hard White Overseas Testing	various-OR	W.E. Kronstad
085	Hard White Overseas Testing	various-WA	B. Miller
086	Hard White Overseas Testing	various-WA	C.F. Konzak
122	Hard White Overseas Testing	various-WA	E. Donaldson

An extensive collaborative analysis report entitled "1992 Overseas Collaborative Quality Analysis of Hard White Wheat Varieties for Production of Asian Noodles" was prepared by U.S. Wheat Associates, Portland, OR. Another report entitled, "Report on the 1992-Crop Hard White Collaborative Testing Program" was prepared July 1993, by Dr. Craig F. Morris, Director of the USDA-ARS Western Wheat Quality Laboratory. This report by Dr. Morris summarizes the evaluation and findings of these hard white varieties and/or breeding lines as reported by U.S. Wheat Associates. Bread was baked on all lines. Rapid Visco Analyzer (RVA) viscosity was determined on all lines. RVA is a hot-pasting viscosity measurement generated by a Rapid Visco Analyzer. The viscosity reported is the peak viscosity (Centipoise/10) obtained at 93° C, after 2 minutes of pregelatinization at 65° C. It attempts to emulate the Amylograph, which is used by foreign customers to measure starch quality. Amylograph Viscosity value (not analyzed here) of 750 Brabender Units (BU) has been suggested by foreign users as a minimum value and values of 1000 BU or greater are desirable for noodle quality. Minimum RVA values would probably be near 180 with values above 210 more desirable. Alkaline flour color (COLOR) was scored on all lines. Color represents an extremely important quality criterion in Asian types of noodles. A preliminary alkaline flour color test was initiated. An alkaline Pekar slick was used to subjectively measure flour color. The Pekar slick was prepared by pressing flour to a smooth surface, immersing in a 1.0% alkaline solution consisting of 60% K₂CO₃ and 40% Na₂CO₃ for 2 minutes. The sample rested at a room temperature of (77°F) for 4 hours before visual observation and scoring. Flours were scored by the following: S = satisfactory, Q = questionable, and U = unsatisfactory. Desirable flour color ranges from bright white through creamy yellow to bright yellow. Any dullness, brown, or greenish casts would be unacceptable. Alkaline flour color (COLOR) is scored only on SWW, HWW, SWS and HWS wheats which have a minimum RVA viscosity of 150 and a minimum NIR wheat hardness (UWHRD) value of 40.

REPORT ON THE 1992-CROP HARD WHITE COLLABORATIVE TESTING PROGRAM

Craig F. Morris, Director

USDA-ARS Western Wheat Quality Lab

August 1993

Introduction. Wheat exports are crucial to the vitality of the U.S. economy. Over the past several years, the U.S. has experienced a severe decline in market share in some major wheat importing countries of the Pacific Rim. This loss of market share has been attributed to, in large part, the inability to directly compete with Australian Standard White (ASW) wheat. ASW has become the preferred wheat for many Asian food products, particularly noodles. A general consensus has emerged among the various segments of the wheat industry in the Pacific Northwest (PNW) that new wheat varieties should be developed to meet the ASW challenge. Hard white, now a separate market class, has been viewed as the appropriate vehicle for the orderly marketing of these new wheat varieties.

The question now stands as to what attributes should these new hard white wheats possess? During a recent meeting, Tom Mick, Mark Samson, Tom Winn, and John Oades emphasized that new hard white wheats should have good noodle quality but should also be acceptable to the domestic bread industry. Bread quality equivalent to Great Plains hard red winter was advanced as the desirable target. Additionally, the aim of developing a "perfect" noodle wheat was viewed as unrealistic. A new variety should possess those quality attributes which allow it to be processed into the widest possible range of oriental noodles. This approach allows one to focus in on specific quality traits, in the context of various cultural preferences for noodles country-by-country. The aim of the hard white collaborative testing program is to obtain this type of information and incorporate it into the variety development program, while at the same time identifying advanced breeding lines that are suitable for commercial release.

Acknowledgement. Breeding lines from the Pacific Northwest state breeding programs were tested with the cooperation of U.S. Wheat Associates. Data are derived from their report.

Table I lists the breeding lines submitted for overseas collaborative testing.

Table I. Breeding lines and check varieties submitted for overseas collaborative noodle testing.

Line	Habit	Breeder	State	Grain Protein
ID377S	spring	Souza	Idaho	14.6
ID377M	spring	Souza	Idaho	14.8
ID377T	spring	Souza	Idaho	14.7
ID355	winter	Souza	Idaho	13.7
OR487279	spring	Kronstad	Oregon	14.1
OR850513	winter	Kronstad	Oregon	10.8
ORF8413	winter	Kronstad	Oregon	12.6
WA7679	winter	Donaldson	Washington	10.6
APB W 10-8	spring		California	12.7
ND676	spring		North Dakota	14.7
Yecora Blanco	spring		California	11.3
Klasic-1	spring		'92 ID	14.5
Klasic-2	spring		'92 OR/WA	13.6
Klasic-3	spring		'91 CA	13.2
Klasic-4	spring		CA	14.4
Federation	spring		Washington	11.0

Analysis. Analytical approaches were selected to address the following:

- 1) By country, does amylograph viscosity relate to noodle score?
- 2) By country, does protein quantity relate to noodle score?
- 3) By holding genotype constant, *i.e.* using the Klasic samples only, can variables related to noodle score be identified?
- 4) How well did the lines perform in terms of noodle color?
- 5) What were the major defects, if any, of the lines?
- 6) What was the general performance of the various lines?
- 7) How well and for what markets does the California Wheat Commission test predict noodle score?

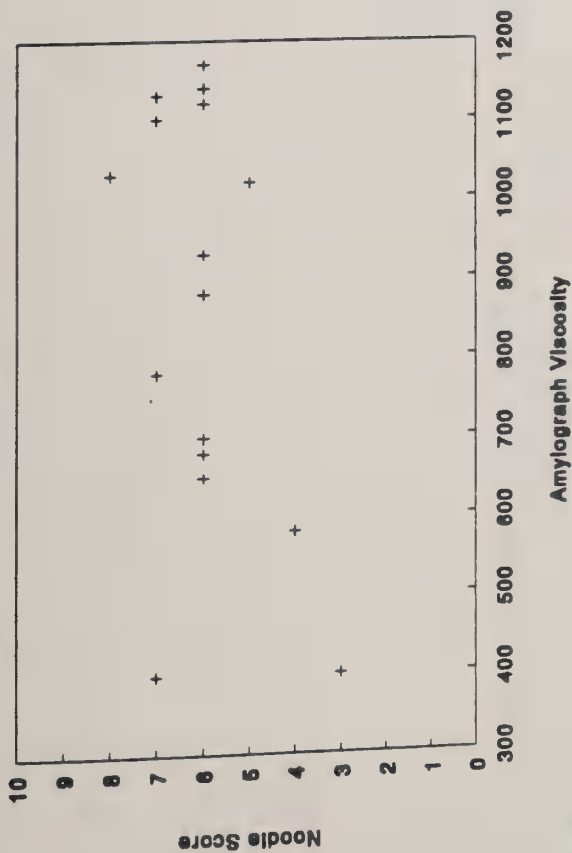
Results. Following are the results based on the above approaches.

- 1) Fig. 1 presents plots, by country, of amylograph viscosity vs. noodle score.
- 2) Fig. 2 presents plots, by country, of wheat protein vs. noodle score.

Obviously, neither starch paste viscosity nor grain protein content alone explain noodle quality. Protein content does appear to play a significant role in the Korean market, however. If Federation and APB W 10-8 are deleted from the data set, a reasonably good relationship with negative slope is revealed between protein and noodle score. Though not readily apparent from the plots, the Korean market prefers a moderately high

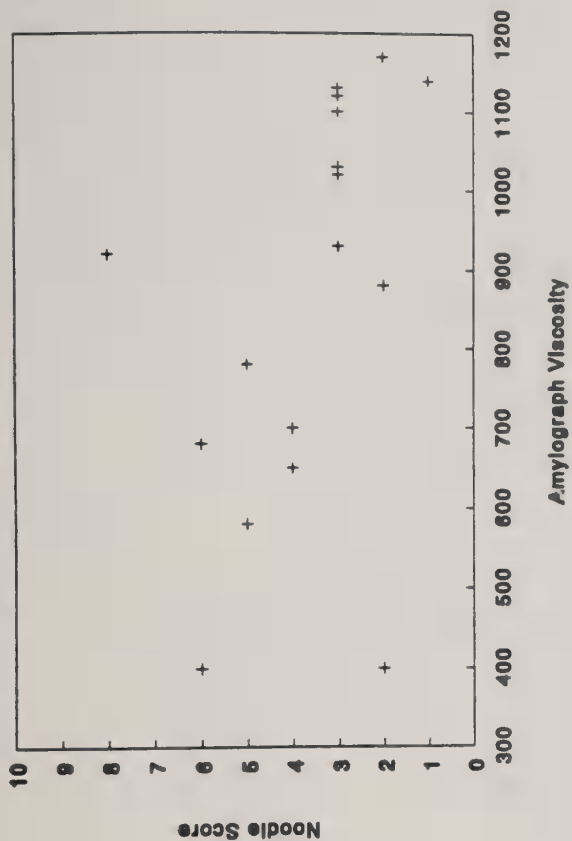
CALIFORNIA

Amylograph Viscosity vs. Noodle Score



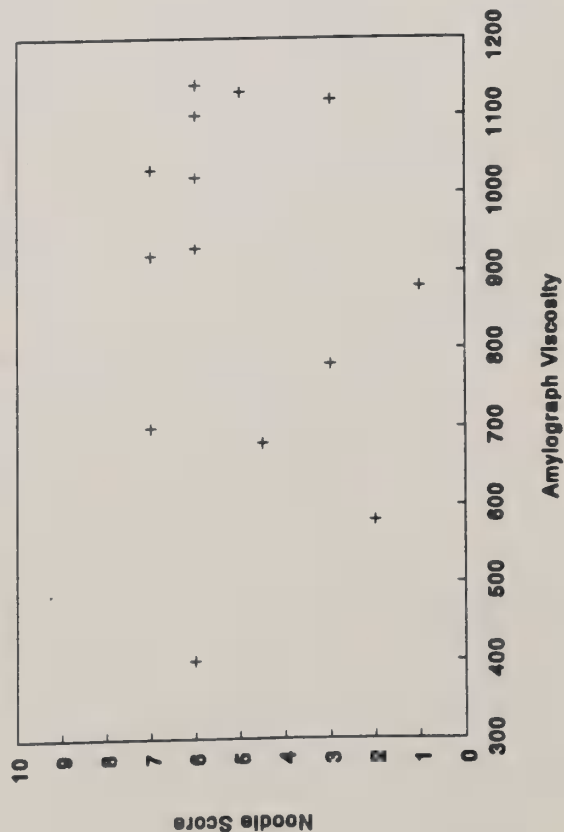
KOREA

Amylograph Viscosity vs. Noodle Score



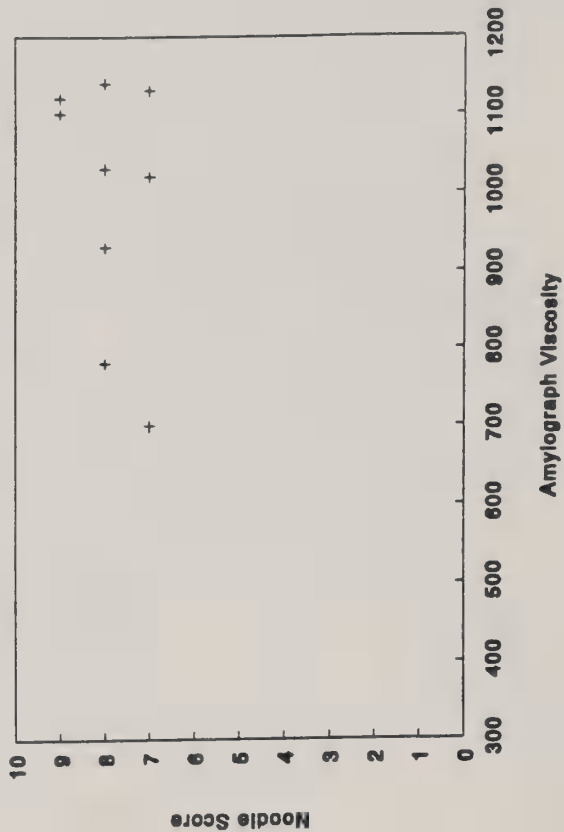
MALAYSIA

Amylograph Viscosity vs. Noodle Score



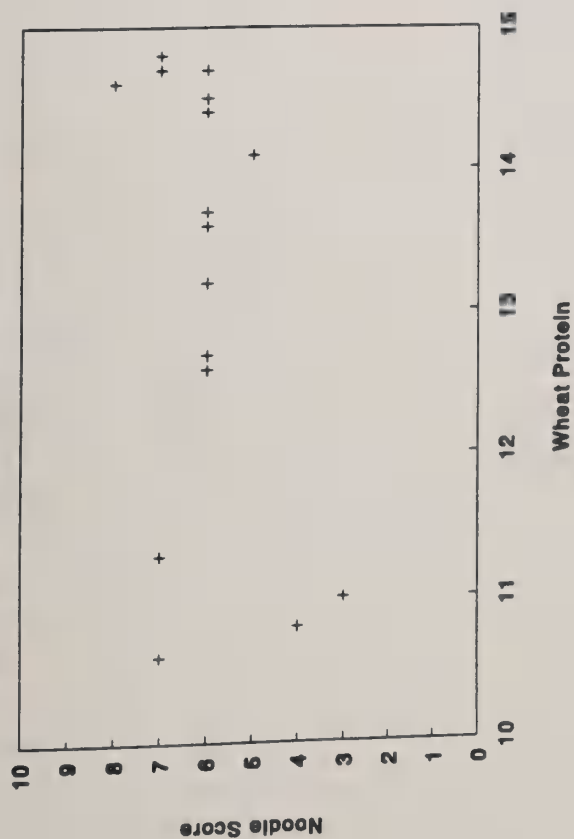
TAIWAN

Amylograph Viscosity vs. Noodle Score



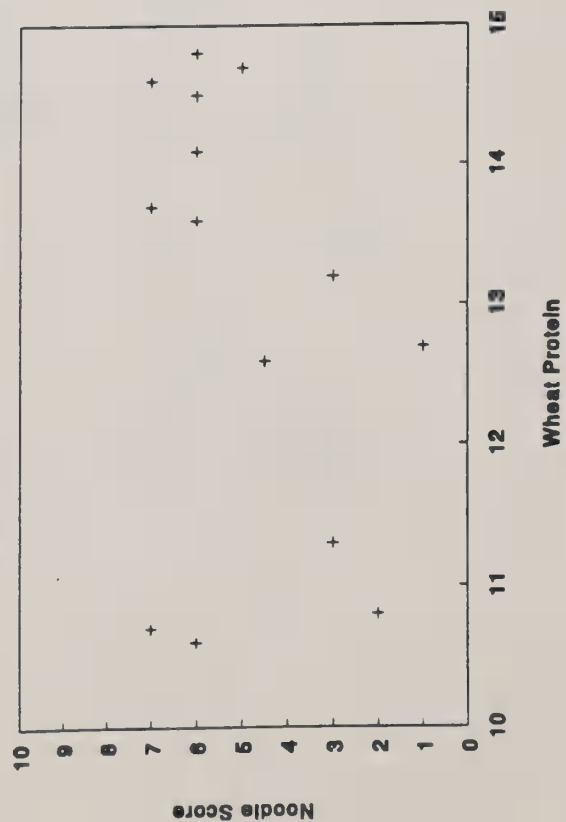
CALIFORNIA

Wheat Protein vs. Noodle Score



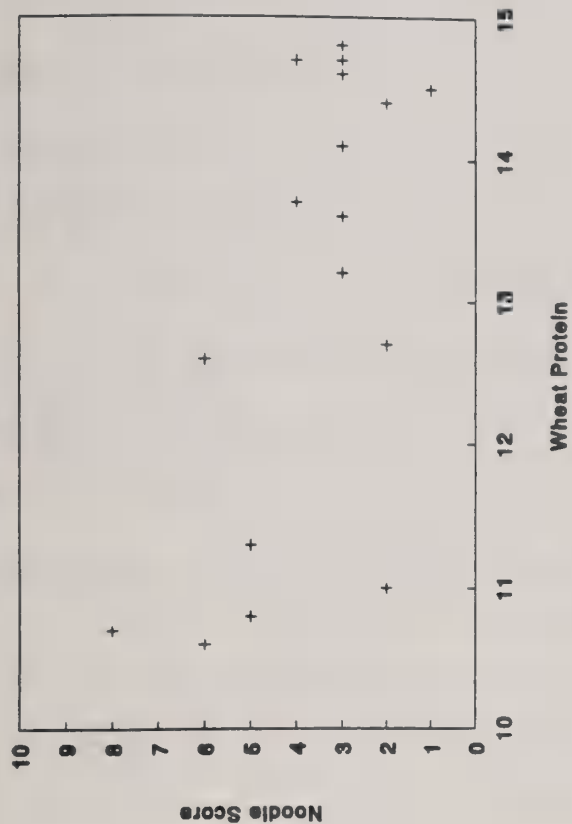
MALAYSIA

Wheat Protein vs. Noodle Score



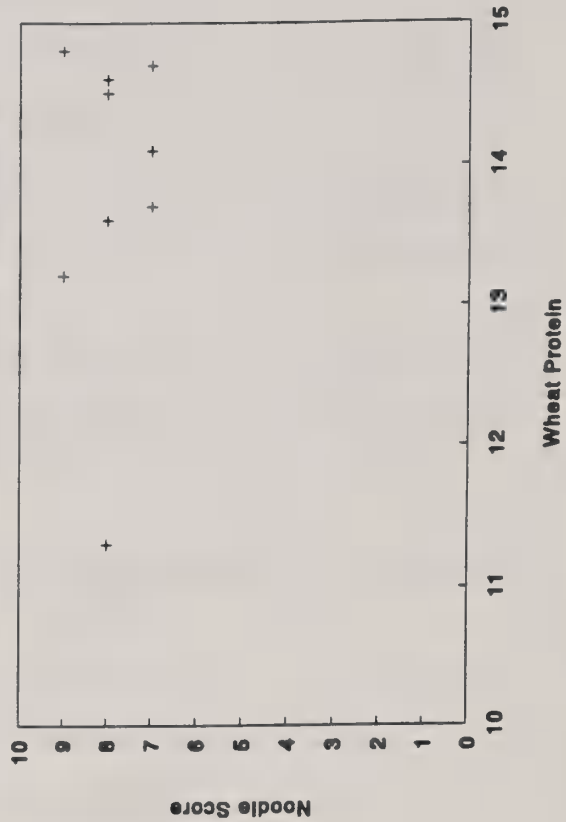
KOREA

Wheat Protein vs. Noodle Score



TAIWAN

Wheat Protein vs. Noodle Score



amylograph viscosity (see defects, below). Unfortunately, the high protein content of a number of lines probably overshadowed their higher (and more desirable?) amylograph viscosities. Malaysia, on the other hand, appears to prefer higher protein wheat, as evidenced by a somewhat positive relationship between protein and noodle score. However, if lines are deleted based on poor color (see defects, below) then the remaining lines show no relationship between protein and noodle score (scores of 6 and 7 for wheats with protein from 10.6% to 14.8%). Taiwan demonstrated no particular preference for protein content among the lines tested, but did exhibit a positive trend between amylograph viscosity and noodle score.

3) Comparing the various grain lots of Klasic did not indicate any significant preference for amylograph viscosity or wheat protein. However, a relatively narrow range for both traits was present. Somewhat unsettling is the highly variable scores among grain lots given to this genotype.

4) The most detailed color information was obtained from the interpretive summaries of Malaysia, followed by Korea. Results are presented in Table II.

Table II. Noodle color and noted defects of lines by country (nr = not reported).

Line	Color		Defects	
	Malaysia	Korea	Malaysia	Korea
ID377S	++		nr	hi pro.
ID377M			nr	hi pro.
ID377T	-		nr	hi pro.
ID355	++		pro. too strong	hi pro.
OR487279			pro./extensibil.	hi pro.
OR850513	-	-	color/low pro.	color/lo amylo.
ORF8413	--		nr	nr
WA7679	+	-	nr	color/lo amylo.
APB W 10-8	--		nr	pro. too strong
ND676			nr	hi pro.
Yecora Blanco	-		nr	lo amylo.
Klasic-1	+		nr	hi pro.
Klasic-2	+		nr	hi pro.
Klasic-3	-		nr	pro. too strong
Klasic-4			nr	pro. too strong
Federation			nr	pro. too weak

5) Defects were also gathered from the interpretive summaries of Malaysia and Korea. Results are presented in Table II, above. Malaysia noted few defects other than color while Korea placed major emphasis on protein content and strength, followed by amylograph viscosity.

6) To compare the general performance of the lines, two approaches were taken. Both were based on noodle scores (Table III). The first simply ranked the lines for each country (Table IV).

The second approach attempted to assess the overall performance of the lines across all countries. Using the nine lines tested in common in Malaysia, Korea, Taiwan, and California, a location average score was calculated and subtracted from 5 to obtain a score adjustment which was then used to adjust all scores from that location. These scores are presented in Table III. This adjustment provided some equalization of scores across locations. The rankings produced by this average adjusted score are presented in Table IV.

Table III. Noodle scores (first column) and adjusted scores (second column) by country, and overall average adjusted score for breeding lines and check varieties.

Line	Malaysia		Korea		Taiwan		CWC		Ave. Adj.
ID377S	7	6.6	3	4.9	8	5.1	8	6.6	5.8
ID377M	6	5.6	3	4.9	9	6.1	7	5.6	5.6
ID377T	5	4.6	3	4.9	7	4.1	7	5.6	4.8
ID355	7	6.6	4	5.9	7	4.1	6	4.6	5.3
OR487279	6	5.6	3	4.9	7	4.1	5	3.6	4.6
OR850513	4.5	4.1	6	7.9	-	-	5	4.6	5.5
ORF8413	2	1.6	5	6.9	-	-	4	2.6	3.7
WA7679	6	6.6	6	7.9	-	-	7	5.6	6.7
APB W 10-8	1	0.6	2	3.9	nd	-	6	4.6	3.0
ND676	-	-	4	5.9	-	-	6	4.6	5.3
Yecora Blanco	3	2.6	5	6.9	8	5.1	7	5.6	5.1
Klasic-1	6	5.6	1	2.9	8	5.1	6	4.6	4.6
Klasic-2	6	5.6	3	4.9	8	5.1	6	4.6	5.1
Klasic-3	3	2.6	3	4.9	9	6.1	6	4.6	4.6
Klasic-4	-	-	2	3.9	-	-	6	4.6	4.3
Federation	-	-	2	3.9	-	-	3	1.6	2.8
ASW-com'l May.	7	6.6	-	-	-	-	-	-	-
ASW-com'l Kor.	-	-	8	9.9	-	-	-	-	-
Ave. score*	5.4		3.1		7.9		6.2		
Score adjustment	-0.4		+1.9		-2.9		-1.2		

* Average score of nine lines which were tested in common.

Table IV. Rankings of lines by country based on noodle score and average adjusted noodle score.

Malaysia	Korea	Taiwan	CWC	Ave. Adj.
ID377S	ASW-Korea	Klasic-3	ID377S	ASW-Korea
ID355		ID377M		
ASW-Malaysia	WA7679		Yecora Bl.	WA7679
	OR850513	Yecora Bl.	ID377M	ASW-Malaysia
Klasic-1		ID377S	ID377T	ID377S
ID377M	Yecora Bl.	Klasic-1	WA7679	ID377M
WA7679	ORF8413	Klasic-2		OR850513
Klasic-2			Klasic-3	ID355
OR487279	ID355		Klasic-4	ND676
	ND676		APB W 10-8	Yecora Bl.
---mean score of all entries, by location---			Klasic-1	Klasic-2
			ID355	-----ID377T-----
ID377T	Klasic-3	ID377T	ND676	OR487279
	ID377S	ID355	Klasic-2	Klasic-1
OR850513	ID377M	OR487279	OR850513	Klasic-3
	ID377T		OR487279	Klasic-4
Klasic-3	Klasic-2			ORF8413
Yecora Bl.	OR487279		ORF8413	APB W 10-8
			Federation	Federation
ORF8413	Klasic-4			
	AP3 W 10-8			
APB W 10-8	Federation			
	Klasic-1			

Groupings in the first four columns indicate lines that received the same noodle score.

For each of the separate locations, the average score was calculated and added to Table IV. Lines were then noted as being above or below the average score of all lines tested.

7) Currently, the noodle testing methodology at the CWC is the most readily available and will be used on a trial basis by the WWQL beginning with 1993-crop samples. From Table III, the highly variable definition of noodle quality is apparent. CWC identified ID377S as the most promising line as did Malaysia. CWC also identified WA7679 as one of the better lines as did Malaysia and Korea. Also, CWC identified Federation and ORF8413 as poor, similar to Malaysia. Conversely, CWC ranked ID377T high, while in the other three countries it received less than the average score of all lines. APB W 10-8 received the average score from CWC but was clearly unacceptable in the Malaysian market. Predictability of the CWC method may be improved for one or more target markets by considering grain protein and noodle color defects.

Discussion. Based on the rankings and noted defects, each experimental breeding line included in the collaborative test has been placed into one of 4 groups. Broadly defined, these groups are:

- 1) lines that tend to rank relatively high in all markets, exhibiting no major defects, such that the further testing is warranted.
- 2) lines that tend to rank relatively low in all markets, exhibit one or more major defects, and as such, show little promise or need for further testing.
- 3) lines that tend to be highly variable, high in some markets but marginal in others. These lines can be further divided into two groups:
 - a) lines with color defect - consider dropping from further testing.
 - b) lines that were tested at inappropriate protein content - consider further testing.

Lines placed in these groups are as follows:

- 1) WA7679, ID377S, ID377M
- 2) Federation, APB W 10-8, ORF8413, OR487279, ID377T
- 3a) OR850513, Yecora Blanco
- 3b) ID355, Klasic, ND676

Obviously, noodle quality is a complex issue. From the outset, all analysis and discussion has the very large caveat that the collaborator data is accurate, reliable, and reflective of true market needs. Given this, the type of information obtained from the collaborative testing program will necessarily be used to guide variety development and release activities, in the context of overall marketing strategies. This first collaborative test falls short of fully defining all technical aspects of noodle quality. Important information was obtained, however, and important linkages with overseas collaborators were established. The process of incorporating end-user requirements into new wheat varieties must, of course, be an on-going exercise. Greater insight must be gained regarding functional noodle requirements at a technical level. Then, the information must be interpreted in the context of variety development, including such things as heritability of traits and testing methodology. It would appear that no one variety can perform well in all markets. To what extent protein segregation can address this problem is currently unknown. Certainly the mixed performance of those lines noted above may be related to this question.

APPENDIX

GENERAL QUALITY ASSESSMENT OF LINES

INCLUDED IN THE HARD WHITE COLLABORATIVE TESTING PROGRAM

ANALYSIS OF VARIANCE: MEANS, LSD, PROBABILITY AND NUMBER OF OBSERVATIONS. DATA DERIVED FROM BREEDER'S NURSERY EVALUATIONS, WESTERN WHEAT QUALITY LABORATORY.

ID377S

GENOTYPE	TEST WEIGHT	GRAIN PROTEIN	GRAIN HARDNESS	FLOUR YIELD	FLOUR ASH	MILLING SCORE	FLOUR PROTEIN	RVA	WATER ABSORPTION MIXOGRAPH	BAKE	MIX TIME	LOAF VOLUME	CRUMB GRAIN
ID377S	65.6	12.1	63	66.3	0.41	74.1	10.6	264	62.0	66.2	4.3	827	5.0
MCKAY	60.7	12.5	66	69.6	0.33	82.8	10.6	91	61.3	63.2	4.2	937	3.0
LSD	0.6	-	-	-	-	-	-	-	-	-	-	-	0*
P-VALUE	0.02	0.66	0.70	0.20	0.29	0.21	0.96	-	0.69	0.15	0.91	0.22	<0.01
N	4	4	4	4	4	4	4	2	4	4	4	4	4
ID377S	62.5	12.1	63	66.3	0.41	74.1	10.6	252	62.0	66.2	4.3	828	5.0
KLASIC	62.5	12.5	52	68.0	0.35	79.7	11.3	249	62.5	66.0	5.5	970	3.5
LSD	-	-	-	-	-	-	0.6	-	-	-	-	-	-
P-VALUE	0.70	0.20	0.06	0.58	0.27	0.41	0.04	0.26	0.76	0.85	0.10	0.06	0.21
N	4	4	4	4	4	4	4	4	4	4	4	4	4
ID377S	62.6	12.1	63	66.3	0.41	74.1	10.6	264	62.0	66.2	4.3	828	5.0
SERRA	61.5	12.3	48	69.6	0.36	83.1	10.9	194	62.3	64.2	6.0	960	3.5
LSD	-	-	-	-	-	-	-	-	-	-	0*	-	-
P-VALUE	0.17	0.50	0.08	0.23	0.32	0.18	0.20	-	0.89	0.24	<0.01	0.17	0.50
N	4	4	4	4	4	4	4	2	4	4	4	4	4

*All variation accounted for by location.

ID377M & ID377T

GENOTYPE	TEST WEIGHT	GRAIN PROTEIN	GRAIN HARDNESS	FLOUR YIELD	FLOUR ASH	MILLING SCORE	FLOUR PROTEIN	RVA	WATER ABSORPTION MIXOGRAPH	BAKE	MIX TIME	LOAF VOLUME	CRUMB GRAIN
ID377M	61.6	13.9	60	65.9	0.37	79.9	12.4	265	62.1	64.8	4.2 CB*	936	4.0
ID377T	61.7	14.0	61	66.7	0.39	79.8	12.4	261	63.1	64.3	5.0 A	903	4.5
COPPER	61.3	13.9	58	69.4	0.34	85.8	12.4	-	65.6	67.8	4.4 ABC	945	4.5
KLASIC	60.8	14.0	52	68.5	0.36	83.6	12.8	187	64.5	66.2	4.5 AB	1093	3.0
SPILLMAN	59.9	14.1	64	68.6	0.37	83.6	12.8	-	65.3	67.5	3.8 C	978	2.5
LSD	-	-	-	-	-	-	-	-	-	-	0.6	-	-
P-VALUE	0.61	0.99	0.35	0.12	0.36	0.09	0.92	0.41	0.20	0.32	0.05	0.11	0.74
N	10	10	10	10	10	10	10	6	10	10	10	10	10

* Means followed by the same letter are not significantly different as determined by Duncan's Multiple Range Test.

ID355

GENOTYPE	TEST WEIGHT	GRAIN PROTEIN	GRAIN HARDNESS	FLOUR YIELD	FLOUR ASH	MILLING SCORE	FLOUR PROTEIN	RVA	WATER ABSORPTION MIXOGRAPH	BAKE	MIX TIME	LOAF VOLUME	CRUMB GRAIN
ID355	60.5	13.1	72	60.3	0.33	67.4	11.0	-	64.5	68.7	3.6	940	5.0
WANSER	60.0	12.4	69	65.0	0.32	75.9	11.9	-	64.3	67.5	3.1	910	4.0
LSD	-	-	-	-	-	-	-	-	-	-	-	-	-
P-VALUE	-	-	-	-	-	-	-	-	-	-	-	-	-
N	2	2	2	2	2	2	2	-	2	2	2	2	2

OR487279 (aka OR4847279)

GENOTYPE	TEST WEIGHT	GRAIN PROTEIN	GRAIN HARDNESS	FLOUR YIELD	FLOUR ASH	MILLING SCORE	FLOUR PROTEIN	RVA	WATER ABSORPTION MIXOGRAPH	BAKE	MIX TIME	LOAF VOLUME	CRUMB GRAIN
OR4847279	62.1	13.1	60	67.9	0.37	78.9	11.8	260	63.6	66.3	4.1	1006	3.8
KLASIC	63.1	13.3	58	67.5	0.35	77.9	12.1	254	63.6	66.3	5.3	1039	3.8
LSD	0.5	-	-	-	-	-	-	-	-	-	0.8	-	-
P-VALUE	<0.01	0.67	0.70	0.66	0.18	0.60	0.41	0.07	0.92	0.96	0.01	0.21	1.00
N	10	10	10	10	10	10	10	10	10	10	10	10	10
OR4847279	62.1	13.0	62	67.9	0.37	79.9	11.7	-	63.6	66.5	4.0	996	4.0
MCKAY	61.8	12.7	74	69.5	0.34	83.6	11.0	-	61.8	63.8	4.0	960	2.8
LSD	-	-	5	1.2	-	2.0	-	-	0.8	1.0	-	20	0.8
P-VALUE	0.51	0.50	<0.01	0.02	0.08	<0.01	0.12	-	<0.01	<0.01	1.0	0.02	0.01
N	8	8	8	8	8	8	8	-	8	8	8	8	8
OR4847279	61.4	13.0	53	67.7	0.38	83.1	11.6	267	63.4	65.9	4.1	975	4.0
SERRA	61.5	12.3	48	70.0	0.36	78.3	10.9	194	62.5	64.2	6.0	960	3.5
LSD	-	-	-	-	0*	-	-	-	-	-	-	-	-
P-VALUE	0.70	0.28	0.54	0.07	<0.01	0.12	0.21	-	0.14	0.27	0.19	0.37	0.79
N	4	4	4	4	4	4	4	2	4	4	4	4	4

*All variation accounted for by location.

OR850513

GENOTYPE	TEST WEIGHT	GRAIN PROTEIN	GRAIN HARDNESS	FLOUR YIELD	FLOUR ASH	MILLING SCORE	FLOUR PROTEIN	RVA	WATER ABSORPTION MIXOGRAPH	BAKE	MIX TIME	LOAF VOLUME	CRUMB GRAIN
OR850513	63.8	11.4	69	70.8	0.37	82.7	10.4	201	60.6	65.8	3.6	785	6.0
WANSER	63.5	12.5	75	69.2	0.36	80.3	11.2	180	61.3	63.5	4.2	915	4.0
LSD	-	-	-	-	-	-	-	-	-	-	-	-	-
P-VALUE	-	-	-	-	-	-	-	-	-	-	-	-	-
N	2	2	2	2	2	2	2	2	2	2	2	2	2
OR850513	64.1	10.9	63	71.4	0.39	83.1	10.0	137	59.7	61.9	2.1	790	7.0
STEPHENS	63.5	9.5	45	73.4	0.40	85.4	8.4	122	53.2	56.4	2.0	685	9.0
LSD	-	-	-	-	-	-	-	-	-	-	-	-	-
P-VALUE	-	-	-	-	-	-	-	-	-	-	-	-	-
N	2	2	2	2	2	2	2	2	2	2	2	2	2

ORF8413 (aka OR484013)

GENOTYPE	TEST WEIGHT	GRAIN PROTEIN	GRAIN HARDNESS	FLOUR YIELD	FLOUR ASH	MILLING SCORE	FLOUR PROTEIN	RVA	WATER ABSORPTION MIXOGRAPH	BAKE	MIX TIME	LOAF VOLUME	CRUMB GRAIN
OR484013	61.2	12.8	80	70.4	0.41	82.0	12.1	210	63.2	65.8	3.8	936	4.5
KLASIC	63.0	13.7	60	70.4	0.36	83.4	12.9	266	63.6	65.3	4.9	1056	3.1
LSD	1.6	0.6	13	-	0.03	-	0.3	6	-	-	0.7	57	1.3
P-VALUE	0.03	0.01	0.01	0.98	<0.01	0.57	<0.01	<0.01	0.56	0.63	<0.01	<0.01	0.04
N	16	8	8	16	16	16	16	8	16	16	16	16	16
OR484013	63.0	12.7	82	69.6	0.39	83.9	11.6	209	62.9	65.2	3.7	896	4.7
MCKAY	62.2	12.9	78	69.8	0.35	83.6	11.9	113	62.4	64.2	3.6	974	2.2
LSD	-	-	-	-	0.02	-	-	-	-	-	-	-	0.6
P-VALUE	0.25	0.20	0.44	0.84	<0.01	0.25	0.26	-	0.27	0.20	0.84	0.09	<0.01
N	12	6	6	12	12	12	12	2	12	12	12	12	12

WA7679

GENOTYPE	TEST WEIGHT	GRAIN PROTEIN	GRAIN HARDNESS	FLOUR YIELD	FLOUR ASH	MILLING SCORE	FLOUR PROTEIN	RVA	WATER ABSORPTION MIXOGRAPH	BAKE	MIX TIME	LOAF VOLUME	CRUMB GRAIN
WA7679	61.4	14.8	66	68.4	0.36	84.2	13.0	-	63.8	65.5	2.2	957	3.0
HATTON	64.0	13.3	75	68.7	0.36	84.3	12.5	-	63.2	64.1	2.3	913	4.0
LSD	0.8	-	-	-	-	-	0.5	-	-	-	-	-	0*
P-VALUE	<0.01	0.23	0.55	0.30	0.50	0.81	0.03	-	0.37	0.19	0.46	0.09	<0.01
N	8	4	4	8	8	8	8	-	6	6	6	6	6
WA7679	61.9	11.1	73	69.0	0.34	84.7	11.7	-	63.1	64.3	3.1	875	4.0
BATUM	60.9	10.9	60	69.9	0.34	85.9	10.9	-	60.1	60.8	2.4	892	4.3
LSD	-	-	-	-	-	-	0.6	-	1.2	1.8	-	-	-
P-VALUE	0.17	-	-	0.06	1.00	0.11	0.03	-	<0.01	0.01	0.37	0.69	0.74
N	6	2	2	6	6	6	6	-	6	6	6	6	6
WA7679	61.6	13.0	68	65.1	0.33	75.9	11.3	-	64.2	68.6	3.2	880	5.0
WANSER	61.4	13.0	69	68.6	0.33	79.8	12.2	-	64.4	67.1	2.7	945	4.0
LSD	-	-	-	-	-	-	-	-	-	-	-	-	0*
P-VALUE	0.50	0.50	0.84	0.06	1.0	0.0	0.33	-	0.61	0.17	0.63	0.10	<0.01
N	4	4	4	4	4	4	4	-	4	4	4	4	4

*All variation accounted for by location.

CHECK VARIETIES AND NURSERIES FOR DATA SETS

GENOTYPE	1991		1992		1991		1992		1992	
	74	112	GENOTYPE		2	51	GENOTYPE		GENOTYPE	111
ID377S	*	*	ID377M		*	*	ID355		*	*
MCKAY	*	*	ID377T		*	*	WANSER		*	*
KLASIC	*	*	COPPER		*	*				
SERRA	*	*	SPILLMAN		*	*				
SPILLMAN	*		KLASIC		*	*				

GENOTYPE	1991		1992		1991		1992		1991	
	74	80	63	103	112	GENOTYPE		25	33	
OR487279	*	*	*	*	*	OR850513		*	*	*
KLASIC	*	*	*	*	*	WANSER		*		*
MCKAY	*	*	*	*	*	STEPHENS				*
SERRA	*				*					
SPILLMAN	*									

GENOTYPE	1988	1989	1989	1990	1990	1990	1991	1991	1992	1992
	55	56	82	78	79	80	111	63	103	
OR850513	*	*	*	*	*	*	*	*	*	*
KLASIC	*	*	*	*	*	*	*	*	*	*
MCKAY	*	*	*			*	*	*	*	*
BORAH	*	*								
WADUAL		*								

GENOTYPE	1989	1990	1990	1991	1991	1992	1992	1992	1992	1992
	84	43	44	45	67	6	7	111	118	
WA7679	*	*	*	*	*	*	*	*	*	*
HATTON	*		*	*						*
BATUM		*	*				*			*
WANSER			*		*			*		*
COULEE						*				

APPENDIX A. DESCRIPTION OF ABBREVIATIONS

A computer program stores, calculates, retrieves, grades, and tabulates the milling and baking data contained in this report. The following is a list of abbreviations used as column headings in the tables of data. Refer also to the Methods and Interpretation of Data sections for more detailed explanations of data generation, computation, and interpretation.

AWRC	Alkaline water retention capacity (see Appendix B)
BABS	Bake water absorption (percentage by weight, corrected to 14% moisture basis)
BCRGR	Bread crumb grain rating code (see Table 1, Appendix C)
BFYELD	Break flour yield (percentage flour from break rolls by weight of total products)
%BFYELD	Break flour yield (percentage flour from break rolls by weight of total products, short flow method)
%BRAN	Bran recovered (percentage by weight of the total products)
BREEDER #	Plot or bag number within a nursery.
CAVOL	Japanese sponge cake volume (cc)
CLASS	Hardness, color, and season planted
CODI	Cookie diameter (cm)
COLOR	Alkaline flour color rating (see Appendix B)
FABS	Farinograph water absorption (percentage by weight, corrected to 14% moisture basis)
FASH	Flour ash (percentage by weight, corrected to 14% moisture basis)
FMIST	Flour moisture (percentage by weight)
FN	Falling number test for sprout damage
FPEAK	Farinograph mixing peak time (minutes)
FPROT	Flour protein (percentage by weight, corrected to 14% moisture basis)
FSTAB	Farinograph stability time (minutes)
FYELD	Flour yield (percentage flour by weight of total products)
LOCATION	Location sample was grown
LVOL	Bread loaf volume (cc)
MABS	Mixograph absorption (percentage by weight, corrected to 14% moisture basis)
%MIDDS	Unground middling stock (percentage by weight of the total products recovered)
MSCOR	Milling score (see Appendix B)
MTIME	Optimum mixing time for bread dough (minutes)
MTYPE	Mixograph type (see Appendices B and C)
NOSCOR	Noodle score (scale 1-100, see Appendix B)
NURSNUM	Nursery code number (located in the upper left corner of the tables)
NYELD	Noodle yield (weighted score assigned to WTIN)
%PFYELD	Potential flour yield equal to break flour and unground middling stock (percentage by weight of the total products recovered).
PROQ	Protein quality (see Appendix C)
RVA	Rapid Visco-Analyzer (peak starch paste viscosity, centipoise X 10)
SAMPLE #	Sample number
SCSOR	Sponge cake score (scale 1-100, see Appendix B)

TGS	Cookie top grain score (scale 0-10, see Appendix B)
TWT	Test weight (lbs/bu, after cleaning but before scouring)
UWHRD	Udy cyclone mill wheat grain hardness (NIR value, dimensionless)
VARIETY	Variety name, state number or unique identifying number
VISC	Predicted McMichael viscosity (observed modified Brookfield viscosity x 7.5)
WASH	Wheat ash (percentage by weight, corrected to 14% moisture basis)
WDSI	Wheat Cibacron blue dye test for alpha-amylase
WMIST	Wheat moisture (percentage by weight)
WPROT	Wheat protein (percentage by weight, corrected to 12% moisture basis)
WTIN	Noodle weight increase (percentage water uptake after cooking)
YEAR	Year sample harvested

APPENDIX B. METHODS

Sample Preparation: All wheat samples were frozen at -27°C for 2 d to kill insects, cleaned on a Kice aspirator, measured for test weight and then scoured and sub-sampled for proximate analysis.

Test Weight (TWT): Determined by AACC Method 84-10 (1).

Udy Wheat Hardness (UWHRD): The standard FGIS NIR wheat grain hardness value. Uses the Udy Cyclone mill with a 0.5-mm screen as the standard grinder (AACC Method 39-70A).

Buhler Milling: All of the samples of advanced and regional nurseries are milled on a Buhler pneumatic laboratory mill (Fig. 1). The samples are tempered to a predetermined moisture content ranging from 14.0% to 16.0%, depending on the hardness and known flour-bolting properties. The harder wheats require more water. Thus, the grain is conditioned so that the most rapid and complete separation of endosperm can be made. The temper solution contains a wetting agent (0.1% Aerosol OT) to hasten moisture penetration. The wheat is allowed to temper for 16-24 hours before milling to permit uniform distribution of the moisture. An additional 0.5% water is added 15-20 minutes prior to milling. The first and second break and first and second reduction streams predict long patent flour yield. All six flour streams are then combined to make a straight-grade white flour by sifting on a 120 stainless steel wire screen and thoroughly blending.

Flour Yield (FYELD): The percentage by weight of the total products recovered as straight-grade white flour.

Break Flour Yield (BFYELD): The percentage by weight of the total products recovered as flour off the break rolls.

Milling Time: The time required in minutes to mill a 2-kg sample with the Buhler experimental mill and obtain a normal separation of bran, shorts, and flour. Time is dependent on adjustments made by an experienced miller after visually observing the milling properties.

Milling Score (MSCOR): Calculated as follows:

$$\begin{aligned} \text{MSCOR} = & 100 - [(80 - \text{flour yield}) + 50 (\text{flour ash} - .30) \\ & + 0.48 (\text{milling time} - 12.5) + 0.5 (65 - \text{per cent long patent}) \\ & + 0.5 (16 - \text{first tempering moisture})] \end{aligned}$$

Modified Quadrumat Milling: The preliminary nurseries (500 g) are experimentally milled on a Quadrumat System as modified by Jeffers and Rubenthaler (11). The procedure is described in the 27th Annual Report, Oct. 1976 (Pgs. 1-14). Conversion of the data to give a predicted Buhler flour yield and milling score are done with the following linear equations:

Predicted Buhler Milling Score

Soft Wheat ($y = -21.60185 + 1.27367 x$)

Hard Wheat ($y = -3.43818 + 1.0448 x$)

where, y = Predicted Buhler flour yield

and x = Original Quadrumat flour yield

Modified Quadrumat Milling Short Flow: Wheat samples (approximately 40-100g size) are atmospherically conditioned (tempered) by placing the wheat (in envelopes) into a constant temperature and relative humidity chamber. Moisture content is raised to the desired level (13.0% - soft wheat and 14.5% - hard wheat). The conditioned wheat is ground only through the Quadrumat break rolls. The standard sifting schedule used in the Modified Quadrumat Senior milling procedure is followed. Break flour produced from hard wheat is usually 25 - 30% and from soft wheat about 45 - 50%. This amount of flour produced is generally sufficient for certain physio-chemical predictive tests that require little flour i.e., mixogram, Rapid Visco Analyzer viscosity, Brookfield viscosity or AWRC.

Micro Milling: Grain samples (5-10 g) from single plant selections are tempered to 14% moisture and milled on the micro mill. The micro mill consists of two pairs of corrugated rolls and double sifters with 38- and 135-mesh stainless steel screens. The bran over the 38-mesh screens is evaluated for milling properties by visual examination for the degree of bran clean-up. The throughs of the 135-mesh stainless steel screen, of those samples considered to be good milling types, are examined for flour quality by means of the Modified Micro Sedimentation Method (12). Protein may be determined on these materials by NIR analysis (17). A schematic flow diagram of the micro mill is shown in Fig. 3 (2,13).

Wheat Moisture (WMIST) & Flour Moisture (FMIST): The reference test uses 2 g of ground wheat in an aluminum moisture dish heated in a forced-draft oven for 40 min at 130°C, allowed to cool and weighed. Flour moisture is determined in the same manner except that it is heated only 20 min (1, modified Method 44-16). The NIR spectrometer (Technicon 500) is routinely used and is calibrated to the above method.

Wheat Ash (WASH) and Flour Ash (FASH): The percentage ash from a 4-g sample of wheat meal or flour ignited and heated for 15 hours at 550°C in a muffle furnace (1, Method 08-01).

Wheat Protein (WPROT) and Flour Protein (FPROT): The protein content of the samples is determined by the NIR method, and checked (about 10% of the samples) by a thermogravimetric method (Leco, model FP-428).

Alkaline Water Retention Capacity (AWRC): The per cent increase in weight of 7.5 g of flour due to absorption of water from 35 mL of 0.1 N NaHCO_3 solution after centrifugation (18) (1, Method 56-10 with proportionate decrease to 5 g flour).

Viscosity (VISC): Dial reading x 7.5 of a RVT Brookfield Synchro-Lectric Viscometer fitted with a modified No. 2 spindle at 50 R.P.M. using a suspension of 20 g of flour in 100 mL of water and 7 mL of 1 N lactic acid (15).

Wheat Cibacron Blue (WDSI): Units: DU/g (dextrinizing units/g). Directly measures alpha-amylase content through liberation of dye from a substrate due to the action of the enzyme. The amount of dye liberated is proportional to the alpha-amylase content of the sample.

Mixogram: Used to characterize wheats as to market class and estimate mixing and baking properties of flours. The 10-g instrument is used and the testing procedure and interpretation of K.F. Finney (9) is followed. To reduce the time and expense involved in reproducing the mixograms, a reference chart was developed to characterize each curve as to type ranging from very weak to exceptionally long and strong types. Instructions for its use are found in Appendix C. The chart appears on page A13. Descriptions of *Mixograph Absorption (MABS)* and *Mixograph Type (MTYPE)* appear in Appendix C.

Farinograph: The Farinograph is equipped with a 50-g bowl and the Constant Flour Weight procedure (14% moisture basis) is employed (1, Method 54-21A).

Farinograph Absorption (FABS): The amount of water required to center the highest portion of the Farinograph curve on the 500 Brabender unit (BU) line.

Farinograph Mixing Peak Time (FPEAK): The time interval, in minutes, from the first addition of water until the curve reaches its maximum height.

Farinograph Stability Time (FSTAB): The number of minutes the top of the curve remains above the 500 unit line when the highest portion (peak) is centered on the 500 unit line.

Cookie Baking: The micro method employs 40 g flour at 25% absorption, 60% sugar, 30% non-emulsified shortening, 3% dry skim milk, 1% NH_4HCO_3 , 1% NaCL, and 1% NaHCO_3 and 0.24% emulsifier (distilled mono- and di-glycerides).

Cookie Diameter (CODI): The average diameter, of one cookie (cm).

Top grain score (TGS): A visual evaluation score describing the top grain of the sugar snap cookie. Range of 0 to 10, with 10 being the best.

Bread Baking: An optimum absorption, optimum mixing, 90 minute fermentation straight dough method using 100 g flour, 1.8% dry yeast, 1.5% salt, 6% sugar, 0.3% malt extract, 4% dry milk solids, 75 ppm ascorbic acid, and 3% partially hydrogenated shortening with mono- and di-glycerides (Crisco) (5,6,7,10).

Bake Water Absorption (BABS): The amount of water required to make a dough of proper consistency for bread baking when mixed to optimum conditions as judged by an experienced baker using the baking method described above (4).

Mixing Time (MTIME): Time in minutes required to mix the flour and the other bread dough constituents to the optimum condition as judged by an experienced baker (5).

Loaf Volume (LVOL): Volume displacement of bread loaf, measured with canola seeds (cc).

Bread Crumb Grain (BCRGR): Subjective judgement of crumb grain quality as judged by an experienced baker.

Protein Quality (PROQ): An assessment of the protein quality for bread baking. The loaf volume of experimental lines is compared to a historical regression that predicts loaf volume based on protein content. If loaf volume of the experimental line is ± 25 cc of the historical, then PROQ = 0. If loaf volume of the experimental differs from the predicted loaf volume by more than 25 cc, then a "+1" or "-1" is generated. This new parameter replaces the previous X-Y scatter plot of protein vs. loaf volume with the historical and nursery regression lines.

Japanese Sponge Cake Baking: Formula contains 100 g flour, 100 g sugar, 100 g fresh egg, 40 g water (16).

Cake Volume (CAVOL): Volume displacement of sponge cake, measured with canola seeds (cc).

Sponge Cake Score (SCSOR): Additive score of texture, volume, external factors and crumb grain (open-ended). The standard flour produces a cake with a score equal to 80.

Udon Noodle Making: Formula contains 300 g flour, 6.0 g NaCl, 96 g water (14% constant flour moisture basis) with dough sheet and noodles prepared with an Otake Laboratory Noodle Machine (16). Often, optimum water absorption is used as opposed to constant absorption.

Noodle Yield (NYELD): Relative score assigned to WTIN (see below).

Noodle Score (NOSCOR): Additive score incorporating raw and cooked noodle color, yield and texture.

Noodle Weight Increase (WTIN): Percentage weight increase of cooked noodle relative to raw noodles.

Rapid Visco Analyzer (RVA): A hot-pasting viscosity measured by the Rapid Visco Analyzer. The viscosity reported is the peak viscosity (centipoise X 10) and is obtained at 93°C after 2 min of pregelatinization at 65°C. It emulates the Brabender Amylograph. Foreign users have suggested that an Amylograph viscosity value (not analyzed here) of 500 Brabender Units (BU or AU) is a minimum value, and 1000 or greater is a desirable value for noodle quality. RVA and Amylograph peak viscosity values have a linear correlation of about 0.99. Therefore, minimum RVA values would be near 125 with values above 210 desirable.

Alkaline Flour Color (COLOR): An alkaline Pekar slick is prepared by pressing flour to a smooth surface, immersing in a 3.0% alkaline solution consisting of 50 % K_2CO_3 and 50% Na_2CO_3 for 2 minutes. The sample rests at a room temperature of 77°F for 4 hours before visual observation and scoring. Flours were scored by the following: S = satisfactory, Q = questionable, and U = unsatisfactory. Desirable flour color ranges from bright white through creamy yellow to bright yellow. Any dullness, brown, or greenish casts are unacceptable. Alkaline flour color is scored only on SWW, HWW, SWS and HWS flours which have a minimum RVA viscosity of 150 and a minimum NIR wheat hardness (UWHRD) value of 40.

Falling Number (FN): Determined by AACC Method 56-81B.

APPENDIX C. INTERPRETATION OF DATA

MIXOGRAM REFERENCE CHART: A mixogram is conducted with 10g of flour and the appropriate amount of water to give optimum absorption. The mixograph is a recording mixer reflecting the resistance of the dough during mixing. Most mixograms are run 5 to 8 minutes, which is sufficient time for most flours to exhibit their mixing time to peak and dough breakdown. Dough breakdown behavior is reflected in the tail of the curve when mixing continues beyond the mixing peak and is commonly referred to as mixing tolerance. The mixogram is used to characterize new selections as to market class and to predict baking properties.

For desirable bread-type wheat flour, from Hard Red and White, Winter and Spring selections with adequate flour protein, a mixogram should have the following properties: high water absorption, moderately long mixing requirements, strong gluten strength, good dough mixing tolerance, minimum oxidation requirement. The dough should be elastic after mixing and should retain this condition throughout the fermentation period. The resulting bread should have adequate loaf volume in relation to flour protein content and satisfactory grain structure, texture and color. Extremely long mixing time is considered undesirable because power and time requirements would be excessive in a commercial bakery. In addition, extremely long mixing time is often associated with tough, bucky doughs which do not perform properly in a mechanized bakery.

For desirable non-bread type wheat flours (*i.e.* those for pastry purposes) from common soft white and club, winter and spring selections, they should be soft, velvety and low in protein content. Their mixograms should have the following properties: low water absorption, short mixing requirement and no appreciable development with continued mixing, *i.e.* the mixing curve area should be low, showing weak and very mellow gluten strength. Club wheat flour should have lower water absorption and weaker mixing properties and gluten strength than the soft common wheat flours.

The mixograms are visually evaluated for gluten strength and mixing properties. Mixogram absorption (MABS) is optimum flour water absorption and is reported as per cent by weight, corrected to a 14% flour moisture basis. MABS is a function of protein content, variety, flour moisture and environment. For bread-type wheat flour, MABS is used to estimate the bread baking absorption (BABS). The mixogram mixing time (not reported) is used to estimate the optimum bread dough mixing time (MTIME). Mixogram curves of bread-type flours with undesirable traits (low flour protein, short mixing time, poor mixing tolerance, weak gluten strength and low water absorption) are often eliminated from further testing, *i.e.* bread baking, in the hurdle (screening) process. Generally, a single undesirable property for any one of the important mixogram properties is sufficient to classify a selection as undesirable.

Final evaluation must be made with consideration to the protein content of the flour due to the effect of protein content on mixing characteristics even within the same variety. As protein increases, mixing time will decrease. This is illustrated on the Mixogram Reference Chart. Compare #1 high(H) with #2 medium (M) and #3 low(L) which are typical mixograms of the club wheat Tres at 12, 9 and 6% protein, respectively. Similarly, 2H, 3M and 4L are typical for Stephens at these protein levels. Little change can be observed on

any wheat above 13.0 or below 7.5% protein. The Mixogram Reference Chart is used to identify the curve characteristics which most closely match the sample chart identifiers, *i.e.* 1L, 1M, 1H, etc. through 8H and are reported as Mixograph Type (MTYPE).

Desirable mixogram characteristics of bread type flours would be characterized on the Reference Chart as high (H) Mixogram type (MTYPE) with preference ranging from 3H to 6H. Desirable mixogram characteristics of non-bread type (pastry flours) would be characterized on the Reference Chart as low (L) or medium (M) Mixogram Type (MTYPE). Preference would be for mixograms in the low (L) category. As described above, this is dependent on protein content.

BREAD BAKING: Bread crumb grain is visually evaluated by a team of trained bakers. Table 1 describes the coding system used for reporting this evaluation.

Table 1. Code and meaning for bread crumb grain rating (BCRGR).

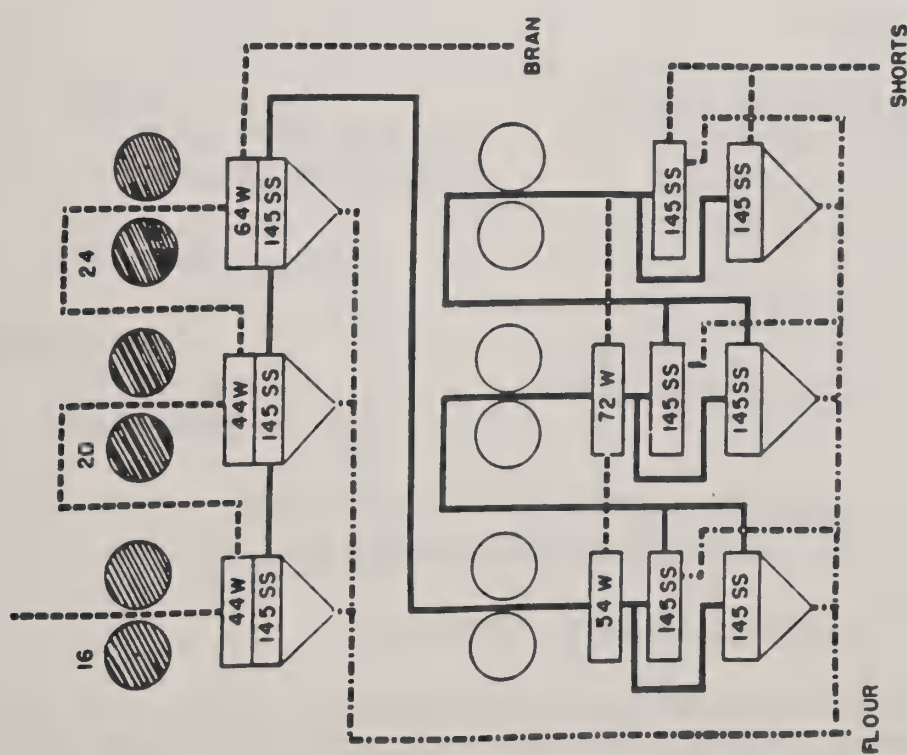
<u>CODE</u>	<u>MEANING</u>	<u>CODE</u>	<u>MEANING</u>
1	Excellent	6	Questionable
2	Satisfactory	7	(Intermediate)
3	(Intermediate)	8	Questionable-Unsatisfactory
4	Questionable-Satisfactory	9	Unsatisfactory
5	(Intermediate)		

COMPUTER GRADING SYSTEM: A computer grades the experimental lines in comparison to a check(s). The system relies on nursery "checks" (standards) and historical standard deviation "windows". The mean of the nursery standards is used to "center" the window. Experimental lines with values that lie within this window are not flagged. Lines with values that lie outside the window are flagged accordingly: "-" for 1 to 2 s.d. poorer than the standard mean, "-2" for 2 or more s.d. poorer than the standard mean, "+" for 1 to 2 s.d. better than the standard mean, "+2" for 2 or more s.d. better than the standard mean. Note also that lines are scored based on desired quality, *e.g.* greater ash values give increasingly negative scores (lower ash is preferred) and protein is scored according to whether the market class is hard or soft. Those cultivars used as standards are indicated with an "*" immediately to the left of the SAMPLE#.

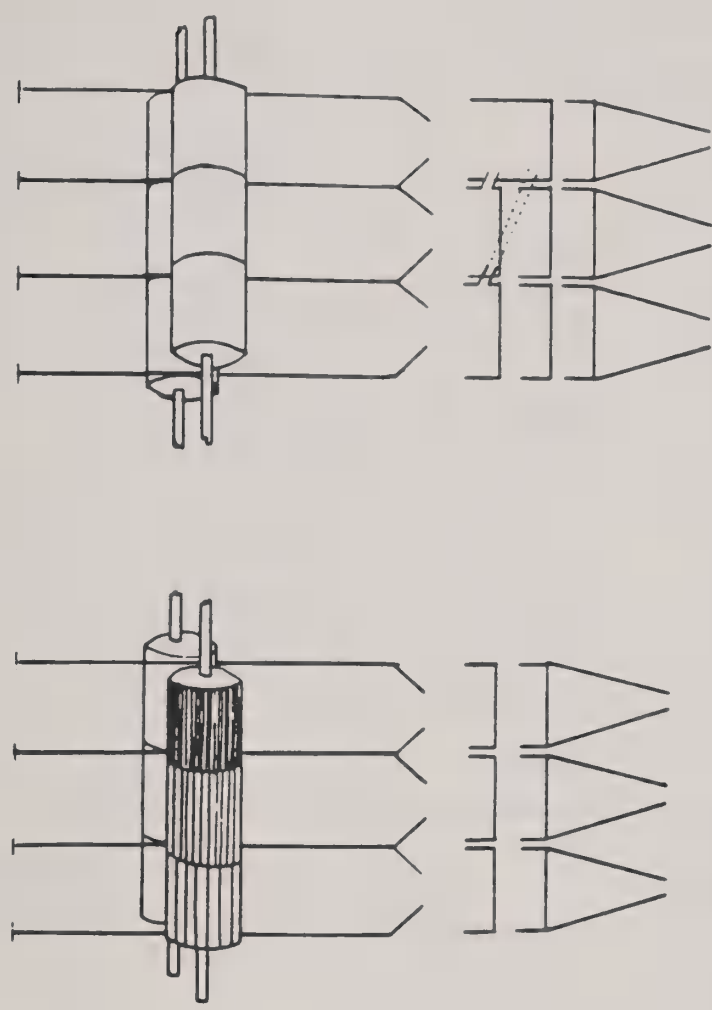
Below the nursery data is a single line which keys the standard(s) (*), lists the mean flour protein for the entire nursery, and describes the type of mill used for flour milling (Buhler or Quad). Below this line are statistics generated by the computer grading system. They are listed by class. Included here are the mean values for the standards (sm) and the means and standard deviations for the experimental lines (NM and NSD, respectively). (Note that "check" varieties not marked as standards are treated as experimental lines). Note too, that standards are not "class-specific", that is a HRS may be used to grade HWS experimental lines.

BUHLER EXPERIMENTAL MILL

Clean Tempered
Wheat



DIAMETER - 6 INCHES
ROLLS: DIFFERENTIAL - 2 TO 1
SURFACE - 300 SQUARE INCHES
BOLTING SURFACE - 288 SQUARE INCHES

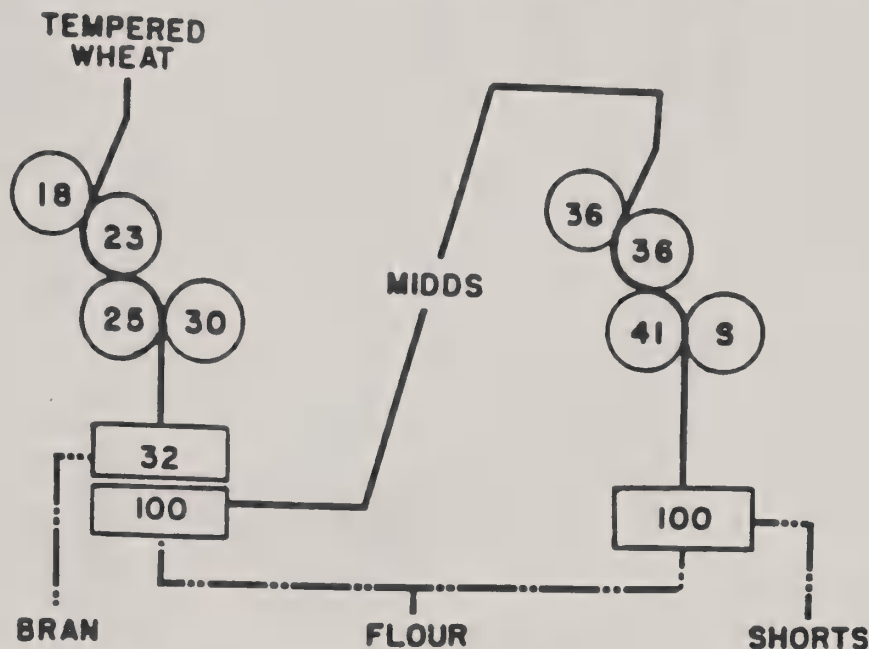


WHEAT TYPE	FEED RATE (G./MIN.)	FLOUR YIELD (%)	FLOUR ASH (%)
WHITE CLUB	145 - 160	73 - 75	0.39 - 0.41
HARD RED WINTER	115 - 130	68 - 73	.35 - .42
COMMON (SOFT) WHITE	90 - 120	67 - 72	.35 - .43

BASES TOTAL PRODUCTS RECOVERED FROM MILL
ASH CONTENT OF STRAIGHT-GRADE FLOUR

Figure 1. Schematic flow of the Buhler experimental mill showing a range of the average feed rates, flour yields, and flour ash of the various classes of wheat. Roll settings are varied for optimum clean-up and reduction of the stock, and feed rates according to the bolting and reduction properties.

MODIFIED QUADRUMAT SR. MILLING PROCEDURE



BREAK UNIT

BRABENDER QUADRUMAT JR. WITH
QUADRUMAT SR BREAK ROLLS

REDUCTION UNIT

BRABENDER QUADRUMAT SR.
REDUCTION HEAD

ROLLS:

Diameters: 2.8 inches

Speed:

Fast rolls: 1200 RPM

Slow rolls: 560 RPM

Differential: 2.14 to 1

SIFTERS:

8 and 12 inch Tyler testing sieves
on strand sifter

SIFTING SCHEDULE: Break Stock:

Bran: Removed after 1 min.

Middlings: Removed after an additional
2 min. (3 min. total)

TEMPER:

Soft wheats 13%

Hard wheats 14.5%

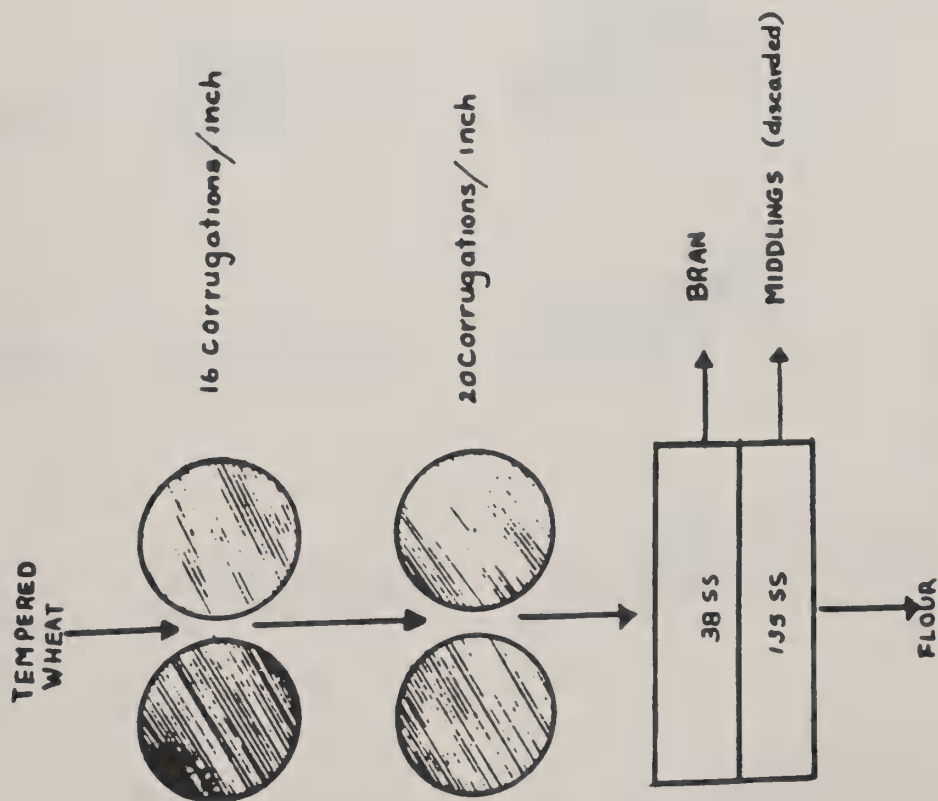
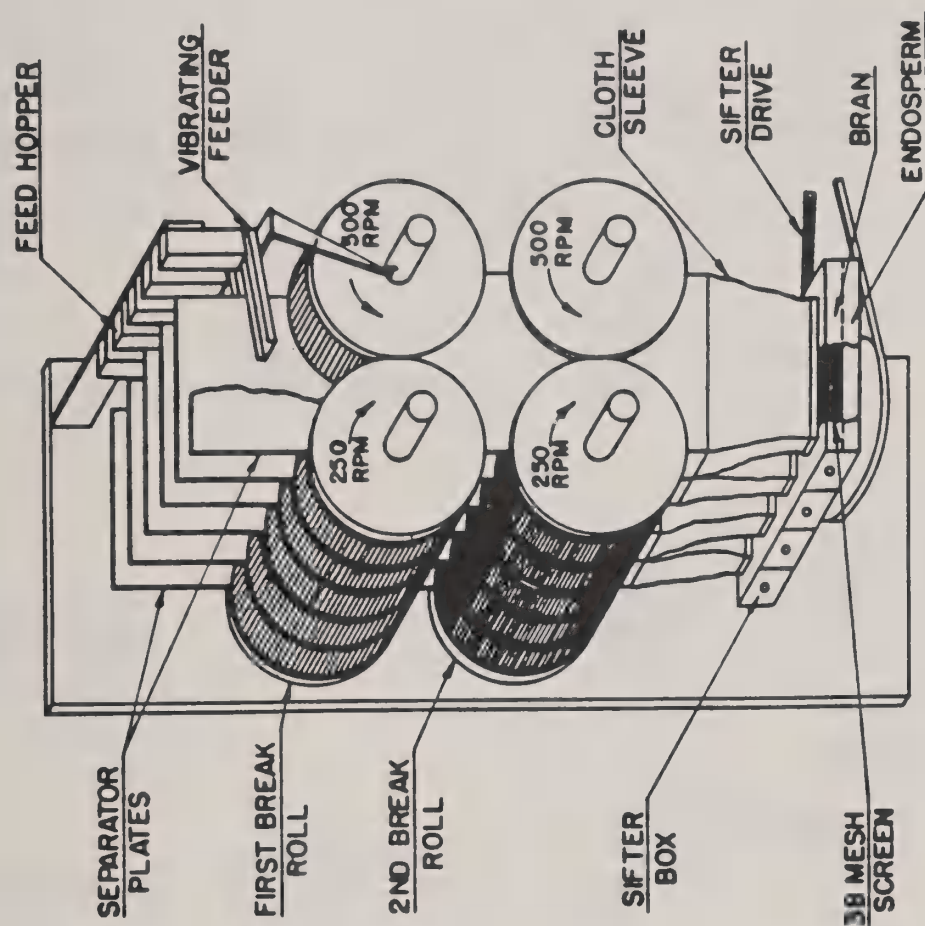
Reduction Stock: 3 min

SAMPLE SIZE: 100-500 grams tempered wheat
(held constant within each comparison group)

OUTPUT: 5-7 samples per hour

Figure 2. Semi-micro experimental mill flow with the roll corrugations per inch. The break rolls have corrugation spirals of 1.25, 1.75, 1.88, and 1.25 inch/ft. in progressive order, and the middling reduction roll spirals are 1.25, 1.25, 1.25, and frosted smooth. Roll spacings for first, second and third break are 0.035, 0.0035, and 0.002 inch respectively. The middling rolls are set at 0.0015, 0.0020 and 0.0015 inch respectively.

MICRO-MILL FLOW



ROLL SPACING 1B .012 INCH
2B .0025 "

Figure 3. Schematic and flow of the micro experimental mill. Four samples are milled and sifted simultaneously and feed rate is held constant by a vibratory feeder.

MIXOGRAM REFERENCE CHART

LOW

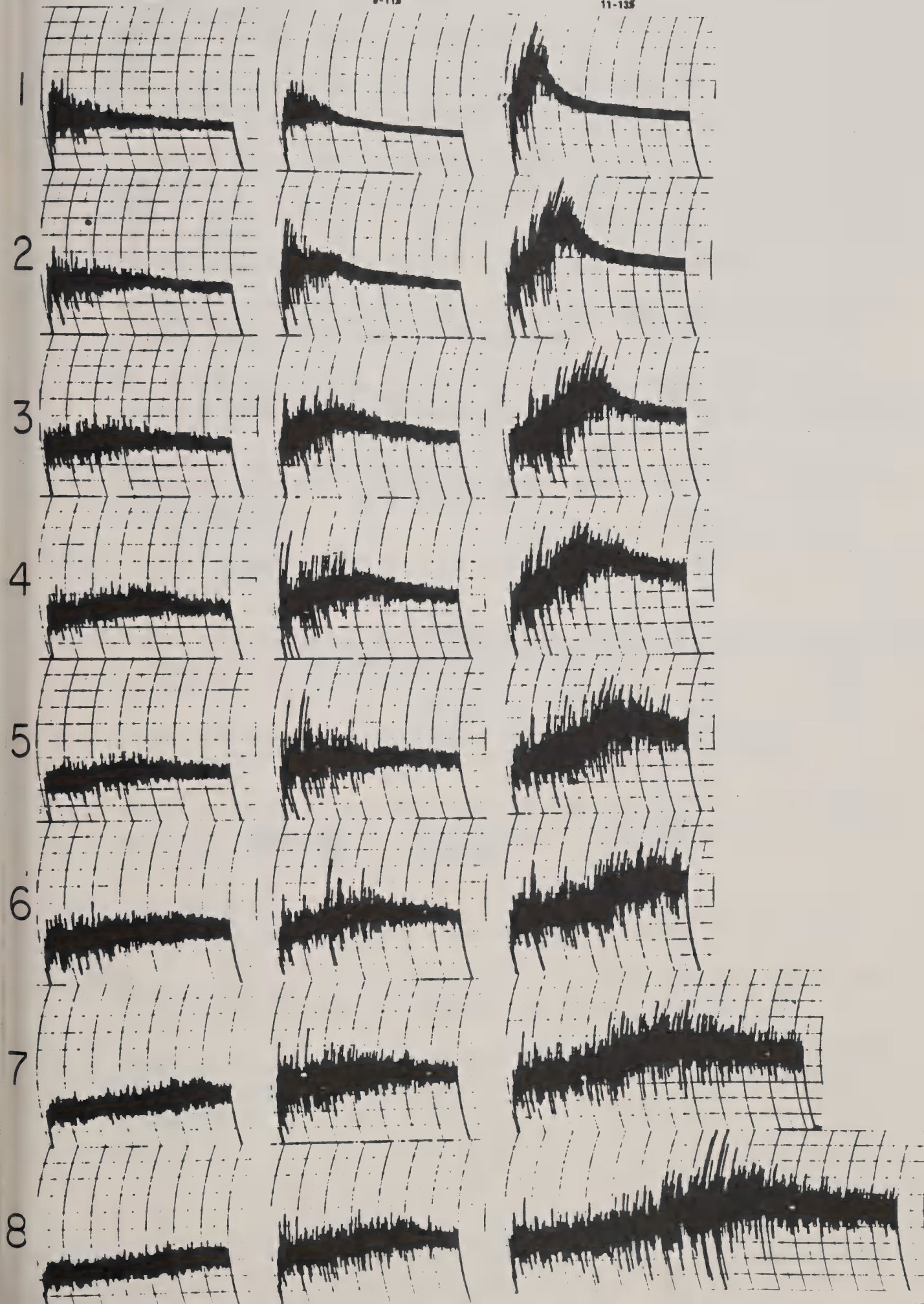
8-95

MEDIUM

9-115

HIGH

11-135



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